

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

DIESEL PROGRESS



FIVE DOLLARS PER YEAR

NOVEMBER, 1953

FIFTY CENTS PER COPY

SAVE FUEL

YOU CAN cut fuel consumption by effective lubrication — that is, using the oil that is exactly suited to your engines and operating conditions. This would be one of the famous *Texaco Ursa Oil* series — a complete line of lubricating oils for Diesel, gas and dual-fuel engines.

The *Texaco Ursa Oil* recommended as right for your engines will assure clean operation . . . freedom from harmful, power-stealing deposits . . . free rings for proper compression and combustion. Thus you'll save fuel, reduce your maintenance costs.

Texaco Ursa Oils are approved by leading engine builders and preferred by operators everywhere. A Texaco Lubrication Engineer will gladly help you select the proper one for your engines. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO

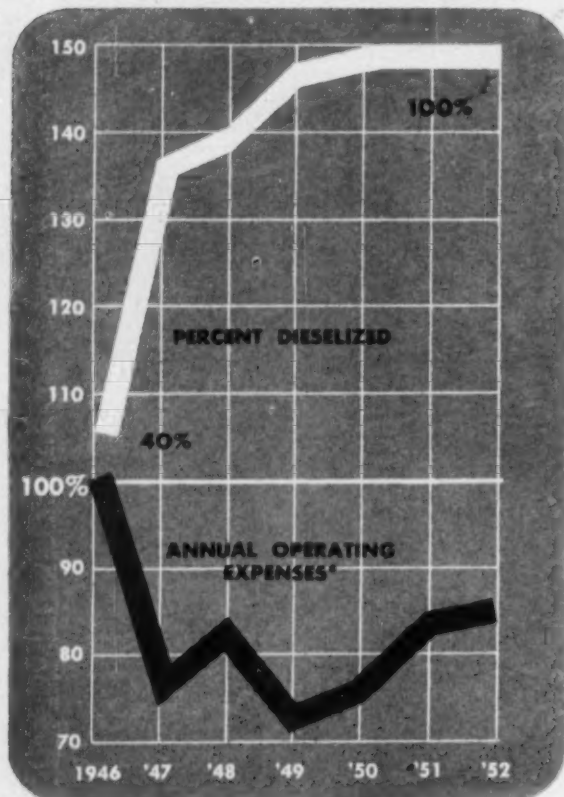




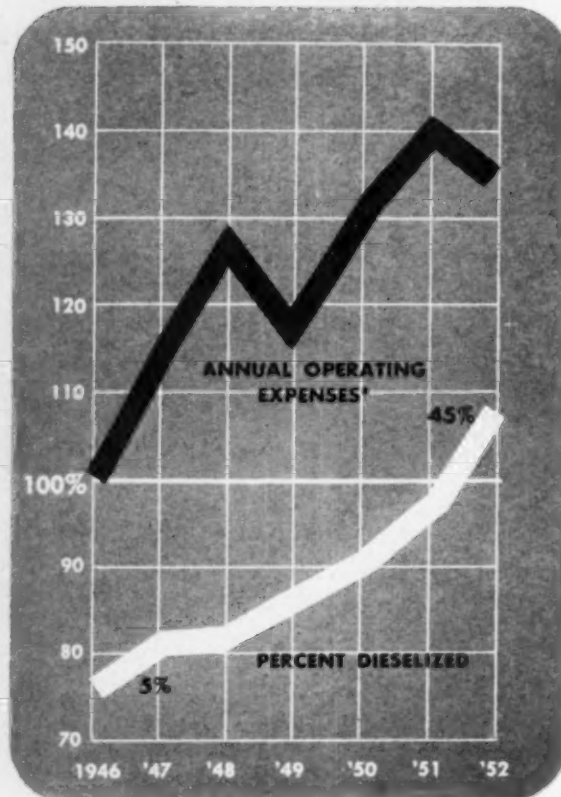
URSA OILS FOR ALL DIESEL, GAS
AND DUAL-FUEL ENGINES

See how Complete Dieselization pays off

**THIS RAILROAD
WAS COMPLETELY DIESELIZED IN 1950**



**THIS RAILROAD
WAS ONLY 45% DIESELIZED IN 1952**

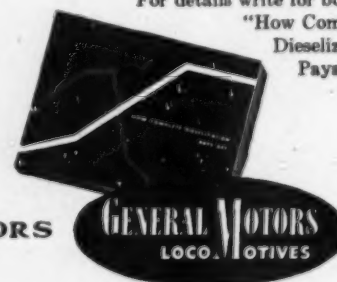


*SOURCE: I.C.C. REPORTS. Annual operating expenses shown as a percentage of 1946 costs. Includes locomotive fuel, repairs, lubricants, water, supplies, enginehouse expense, enginemen's wages, fuel and water station maintenance.

Last year dieselization saved America's Class I railroads \$604,063,000 in fuel and maintenance costs alone.

Complete dieselization would have saved \$249,168,000 more—an average of \$17,780 per year for each and every serviceable steam locomotive whether in use or not!

Railroads cannot afford to delay—
**COMPLETE DIESELIZATION IS
THE BEST INVESTMENT**
For details write for booklet
"How Complete
Dieselization
Pays Off"



ELECTRO-MOTIVE DIVISION • GENERAL MOTORS
LA GRANGE, ILLINOIS • HOME OF THE DIESEL LOCOMOTIVE

IN CANADA: GENERAL MOTORS DIESEL LTD., LONDON, ONTARIO

Here's what
BUDA
is doing
to provide

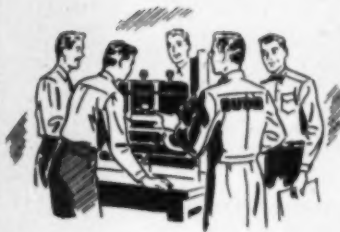
**BETTER
SERVICE**

for
**Buda Diesel
Engine
Owners**

BG-2

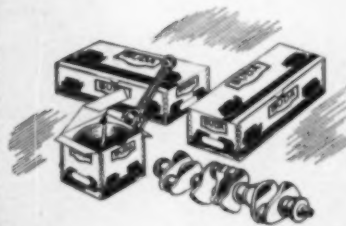
Manufacturers of Material Handling Equipment, Lifting Jacks, Maintenance of Way Products, Earth Drills and Diesel and Gasoline Engines

BUDA SERVICE TRAINING SCHOOL



A modern service school, staffed by Buda Diesel specialists, provides training and refresher courses for Service and Maintenance personnel to insure fast, efficient service on your Buda Diesels. This factory training pays off for you by getting your Buda-powered equipment back in service faster.

LARGER PARTS INVENTORY CARRIED BY DISTRIBUTORS, BRANCHES and DEALERS



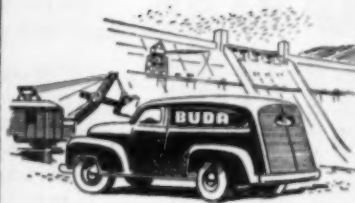
When your Buda Diesels require replacement parts to keep them operating at peak efficiency, it's almost certain that your Buda distributor, branch or dealer will have them in stock. More than \$3,500,000 worth of parts are now stocked by our distributors, branches and dealers from coast to coast.

PREVENTIVE MAINTENANCE PROGRAMS



To keep Buda Diesels delivering long, trouble-free service, a program of normal preventive maintenance has been set up and is available from virtually all Buda facilities. Buda preventive maintenance means less engine downtime and more profitable operation for you.

FAST, COMPETENT FIELD SERVICE



Mobile Service Trucks, staffed by Buda Diesel experts and equipped with normal maintenance items are operated by the vast majority of Buda facilities to give on-the-job maintenance and parts service. You benefit when your equipment stays on the job and maintenance and parts service comes to it.

See your nearby Buda Engine Distributor for complete details on Buda Dyna-Swirl Diesels—the money-making power for any equipment.

BUDA

A POWER-FULL AND
DEPENDABLE NAME
IN ENGINES
AND SERVICE

ESTABLISHED 1881

SEALED-IN POWER! International diesels are built to maintain full power day after day—even in dust like this.



"TURNS ROCK TO DUST

IN ONE OPERATION"

Hamilton Lime Company, Paris, Missouri, Really Knows Value of "Power That Pays!"

A tough combination—an International UD-18 and a UD-24 in a double hook-up—smash out thousands of tons of agricultural lime and road rock every year for Charles Hamilton.

Owner Hamilton knows how much Internationals do for him. He says:

"It really takes power to turn solid rock into dust in one operation. These two Internationals turn out 300 tons of limestone dust in 10 hours and run smooth all the time. Here at the quarry an engine gets put thru the rough dust treatment. Years of good service proved our Internationals can take it."

Internationals that can do a good job like this can do a good job for you. See your International Industrial Distributor. See International power on the job. Get the facts on "Power that Pays!"

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.



INTERNATIONAL

POWER THAT PAYS

announcing **HYDROTOR®**

the **NEW**
revolutionary

HYDRAULIC CRANKING MOTOR

for diesel and gasoline engines

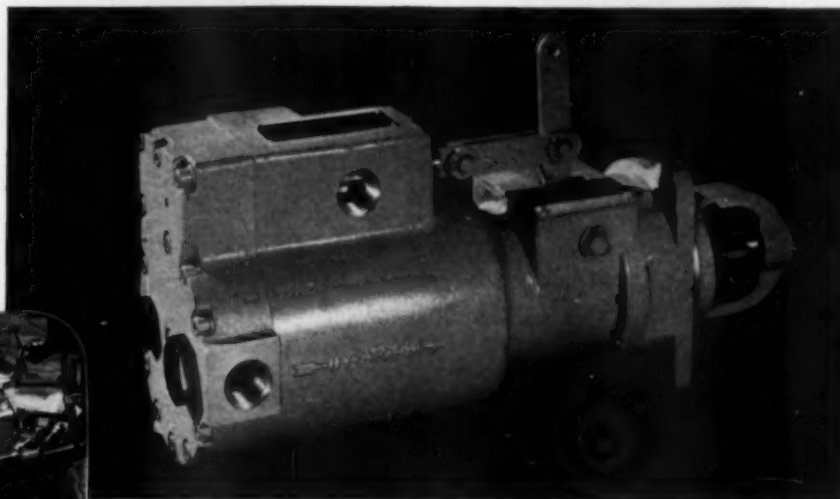
FARM • INDUSTRIAL • MILITARY • MARINE

3
SIZES TO FIT
ALL NEEDS

- Model CM1
- Model CM2
- Model CM5



Illustration at left shows installation of HYDROTOR MODEL CM-2 on OLIVER ROWCROP 88 (Hydrotor in circle)



higher cranking speeds...more efficient starting...arctic to tropics

EFFICIENT DEPENDABLE CRANKING AT ALL TEMPERATURES IN ALL CLIMATES. The same HYDROTOR-equipped units operating through the winters of Northern Manitoba operated with equal success through the summer on the sands of Yuma, Arizona without adjustment or even changing the hydraulic medium.

HIGHER CRANKING SPEED WITH LESS BULK AND WEIGHT. The HYDROTOR has the high torque characteristics of hydraulic motors. Aluminum and bronze construction provide durability with a minimum of weight.

A PRACTICAL REPLACEMENT FOR ORDINARY CRANKING SYSTEMS. Smaller and lighter, yet more powerful than electric or pneumatic starters. The three models of HYDROTORS are furnished with SAE mounting pads for replacement purposes.

TWO CRANKING SYSTEMS IN ONE. The HYDROTOR used in combination with a recharging pump provides automatic cranking with the hand pump available for emergency use.

PROTECTION WHILE OPERATING IN HAZARDOUS AREAS. The HYDROTOR, being non-electric, is completely explosion proof.

ADJUSTABLE CRANKING SPEED. The HYDROTOR will operate over a wide speed range from rotation slow enough to adjust timing or free engine up to maximum rated speed.

MINIMUM MAINTENANCE. The HYDROTOR operates in a closed hydraulic system completely independent from batteries. Energy to crank the engine can be readily restored to the accumulator through the hand pump. There is no "dead-lining" due to failure of batteries or air receivers. Specify "HYDROTOR" Cranking Motor on all new equipment.

Write for more complete details and literature today.

HYDRAMOTIVE, INC.

2323 EAST 67TH STREET

CLEVELAND 4, OHIO



SECOND OF THREE WORTHINGTON UNITS to be installed at Waverly's new plant, this 8-cylinder, turbo-supercharged Worthington engine and its generator are rated at 1350 kilowatts.

**ECONOMICAL CONTINUOUS POWER—Diesels, Oil and Dual Fuel,
and Spark-Ignition Gas Engines, from 150 to 2100 bhp.**

Waverly, Iowa, installs two more Worthington Diesels

For over 15 years, the City of Waverly, Iowa, has been getting economical, dependable power from its Worthington Diesels. That's why, when Waverly built its new West Plant to answer increased power demands, Worthington Diesel engines were the choice of the plant engineers.

The engines selected were two 8-cylinder, turbo-supercharged Worthington Dual Fuel Diesels, with a total capacity of 2595 kilowatts.

With the installation of these units, the West Plant was placed on base-load service, and the old East-side Plant assigned to peak-load duty.

Waverly's experience with Worthington engines justified the selection of Worthington Diesels for its new plant, the most modern of its type. Waverly has repeatedly added Worthington Diesel capacity since 1938, when it established its first Diesel plant with

three Worthingtons. Initial capacity has been expanded from 1100 kw to the present day total of 5445 kw.

Because of the low maintenance costs and efficient operation of these modern Worthington engines, citizens of Waverly are getting dependable electrical power at extremely low rates.

The long successful service that Waverly has had with Worthington Diesels is typical of that received by Worthington users everywhere. If you're interested in low-cost power generation, it will pay you to learn more about the many exclusive features of Worthington Diesels.

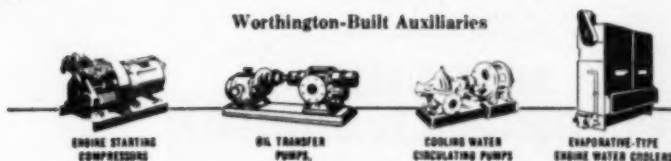
For help in any of your Diesel power problems, call your nearest Worthington district office, or write for Bulletin S-500-B55, to Worthington Corporation, Engine Division, Buffalo, N. Y.



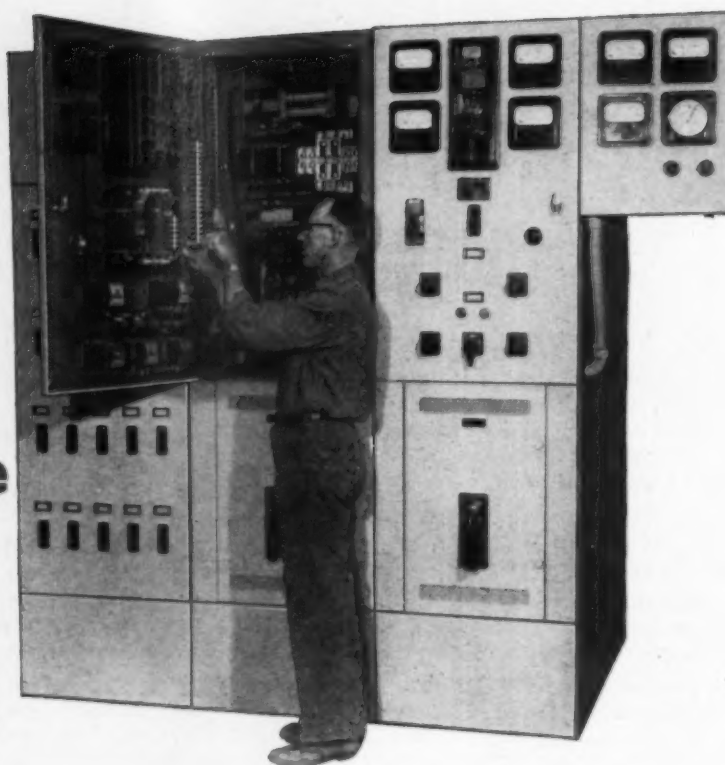
MODERN IN EVERY RESPECT, Waverly's new West Plant has a capacity of 2595 kilowatts, delivered by two supercharged Worthington Dual Fuel Diesels. The plant is completely heated by hot water from the engine water jackets.

E.3.11

Worthington-Built Auxiliaries



**new
safety
new
convenience
in
Generator
Switchgear**



New E-M Swing-Door Instrument Panel

● Take a good look at this new Swing-Door Instrument Panel on E-M Generator Switchgear . . . switchgear with a panel mounted on hinges, opening as a door to expose rear of panel and switchgear interior. Briefly, here are its advantages:

1. SAFER, FASTER TESTING: You can test with greater safety than ever before! No more stretching across busses to reach components. Instruments and protective relays are mounted on the Swing-Door for accessibility.

2. SAFER, FASTER REPLACEMENTS AND CHANGES: New location of fuses makes it possible for you to replace them quickly with complete safety. You have easy access to all parts . . . control circuit connections, selector switches, relays, and others.

3. CLEANER, NEATER ARRANGEMENT: Notice how the back side of the Swing-Door is utilized to fullest advantage for mounting and connections. A special mounting panel on the inside can carry fuses, voltage regulators, transformers, relays, resistors, etc. This extra space makes it possible to spot every component in the most accessible location.

In addition, the new E-M Switchgear shown above features handy draw-out air breakers which may be racked for quick disconnect or complete removal. Large 6-inch instruments are spotted high on the panels for

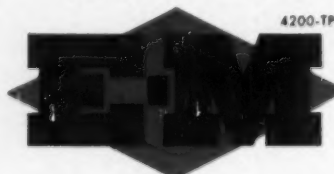
easy reading. And you'll find that E-M Switchgear frames are permanently rigid . . . gusset-plate construction is used throughout.

This new Swing-Door Panel is typical of E-M's "extra value" Switchgear engineering. Each job is engineered and designed individually to meet your most exacting specifications. All E-M Switchgear is completely assembled and tested at the factory . . . it's ready to install.

Ask your nearest E-M sales engineer to give you full information on E-M Switchgear with the new Swing-Door Instrument Panel.

ELECTRIC MACHINERY MFG. CO.
MINNEAPOLIS 13, MINNESOTA

4200-TPA-2130



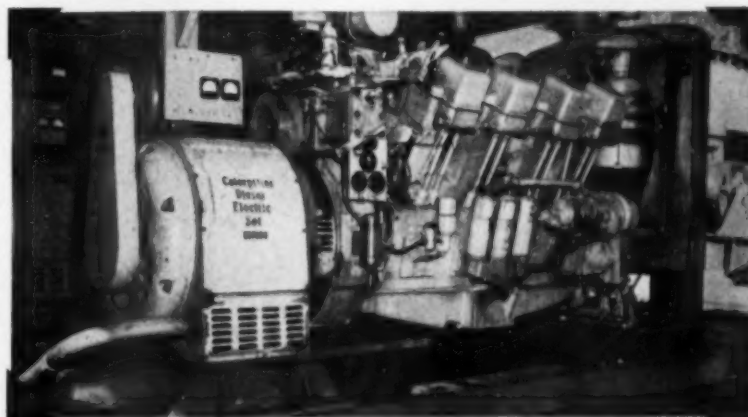
Specialists in
**MODERN
SWITCHGEAR DESIGN**

THE ENGINEER'S REPORT

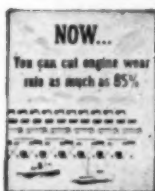
DATA	
LUBRICANT	RPM DeLo Supercharged-2
UNIT	D17000 diesel engine
OPERATION	Constant operation in extreme temperatures
PERIOD	9277 hours
FIRM	Diamond Lumber Co., Glenwood, Oregon

Diesel engine "spotless" after 9,277 hours of work!

THIS D17000 DIESEL ENGINE worked 17 hours per day in weather that varies from below zero to over 100 degrees. Lubricated with RPM DELO Supercharged-2 Lubricating Oil since installation, it was inspected after 9,277 hours of operation. The engine looked as though it had just been thoroughly cleaned — "spotless" according to the engineer on the job. This is one of six D17000 Cats which was used to supply power for Diamond Lumber Company's mill at Lee's Camp, Oregon. This mill cuts approximately 100,000 board feet of Douglas fir per day.



REPRESENTATIVE PISTONS, exactly as they came from engine after 9,277 hours, show cleanliness of all parts. Wear at top of cylinder liners miked only 0.0015 inch! Con rod and main bearings were all good; valves and valve seats were in excellent condition. The RPM DELO Lubricating Oil in this engine was changed at regular intervals.



There is an RPM DELO Oil to meet every heavy-duty engine operating condition.

FREE BOOKLET on the RPM DELO Oils gives you complete information. Write or ask for it today.



How RPM DELO Oils keep engines clean and prevent wear



- A. Contain special additives that provide metal-adhesion qualities...keep oil on parts whether they are hot or cold, running or idle.
- B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean, helps prevent scuffing.
- C. Special compounds stop corrosion of any bearing metal, and oil foaming in both wet and dry sump engines.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor handling them, write or call any of the companies listed below.

TRADEMARK "RPM DELO" REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

CYCOIL PRESENTS "SOLID FRONT" AGAINST DUST



Compressor station of El Paso Natural Gas, Farmington, N. M. Air intakes to each of four 1350 H. P. Cooper-Bessemer units equipped with Cycoil Oil Bath Air Cleaners.

Infiltration tactics fail against two-way cleaning action of this Oil Bath Air Cleaner!

Dust is a sly and relentless enemy but it's fighting a losing battle here. A Cycoil Oil Bath Air Cleaner at the air intake of each of these 1350 H. P. compressors presents a solid defense against "sneak" or "all out" attack.

Cycoil's two-way cleaning action leaves no room for even a small percentage of dust to reach the engine. Thorough mixing of the intake air traps over 90% of the dust, right at the start. Final cleaning action of the filter pads "mops up" the remain-

ing 10% of fine dust particles that slip by the best of front line defenses.

Your dust protection dollars represent only a small fraction of the investment which they guard. Any air cleaner delivering less than Cycoil's approximate 100% efficiency is only fighting a delaying action—a delay against eventual shutdown for costly repairs caused by dust damage. Write today for complete product information and performance data. Ask for Cycoil Bulletin No. 130.



American Air Filter

COMPANY, INC.

408 Central Avenue, Louisville 8, Kentucky • American Air Filter of Canada, Ltd., Montreal, P. Q.

Synchronized Power

writes earth-moving success story



One of Roy Kohl's five scrapers hauling a 24-yard load at Lockbourne Air Force Base. On this 212,000-yard job, the scrapers load in 90 seconds and travel to the spreading site at 30 mph.

In 1949, Roy Kohl was a basement excavating contractor in Ohio. During the last four years he has changed his operation and has moved more than 2½ million yards of ore, earth and clay on many types of big jobs.

His success story is built around the operation of 5 tandem-engine Euclid scrapers. The tandem-engine application—one pulling and one pushing—was made possible by Allison TORQMATIC DRIVES which synchronize the power of both engines through a simple control.

Kohl, like other operators, has found that Allison matched Torque Converters and hydraulic Transmissions contribute many ways to the more successful use of heavy-duty equipment. Most important, of course, is the ease

of operation; the engines' ability to work at peak efficiency; and the cushioning effect which eliminates harmful shock on engines and the entire drive line.

Kohl reports his "Eucs" operate under all conditions, and climb up to 50% grades under full load. The five units now average over 2,000 hours a year. His first scraper moved more than a million yards without any major maintenance on Converter or Transmission.

Your dealer can give you more information about low-cost equipment maintenance where Allison TORQMATIC DRIVES are installed or you may wish to write Allison direct for full particulars.

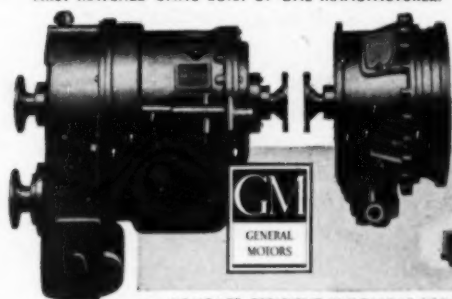
ALLISON DIVISION OF GENERAL MOTORS
Box 894DD, Indianapolis 6, Indiana

ALLISON TORQMATIC DRIVES

Unbeatable Team for Maximum
Operating Economy

- * Quick-shifts at full throttle with fingertip hydraulic control.
- * Holds power to load at all times—no clutch pedal to push—no gearshift guess.
- * Cuts maintenance cost by absorbing shock—eliminates engine lugging—prolongs equipment life.
- * Only torque converter-transmission team designed to work as a unit and built by one manufacturer.

FIRST MATCHED UNITS BUILT BY ONE MANUFACTURER.



Allison TORQMATIC DRIVES



COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES • TRUCKS • TRACTORS • SCRAPERS • SHOVELS • DRILLING RIGS

It Pays to
STANDARDIZE on



for

SAWMILLS

PLANING MILLS

TRUCKS

TRACTORS

CRANES

LOADERS

HOISTS

HIGHLINES

DEBARKERS

RESAWS

WOOD CHIPPERS

OFF-LINE ELECTRIC
GENERATORS

VENEER MILLS

STAVE MILLS

TUBS

BOOM BOATS



AT HOME IN THE WOODS

... this Diesel takes toughest jobs in stride

YOU'LL find this Diesel purring away on big jobs and small—furnishing the power to do all kinds of logging jobs safely, smoothly, dependably and economically.

You'll find it driving sawmills on mountainside elevations—where some engines would be gasping for air.

You'll find it handling scores of other heavy-duty lumbering jobs where rugged, compact, portable power is needed.

That's the big fact about this General Motors 2-cycle Diesel—it doesn't care what's tied to it! And that fact makes it a *natural* in the woods.

Because of its 2-cycle operation—power at every piston downstroke—the GM Diesel packs more power in less space and with lighter weight, which makes it easier to move around.

It starts quickly on Diesel fuel alone—delivers a steady flow of power that "hangs on" like a steam engine—is even faster accelerating than a gasoline engine and far more responsive to variable load demands. And its clean, simple design, with readily available interchangeable parts, makes it easy and economical to maintain.

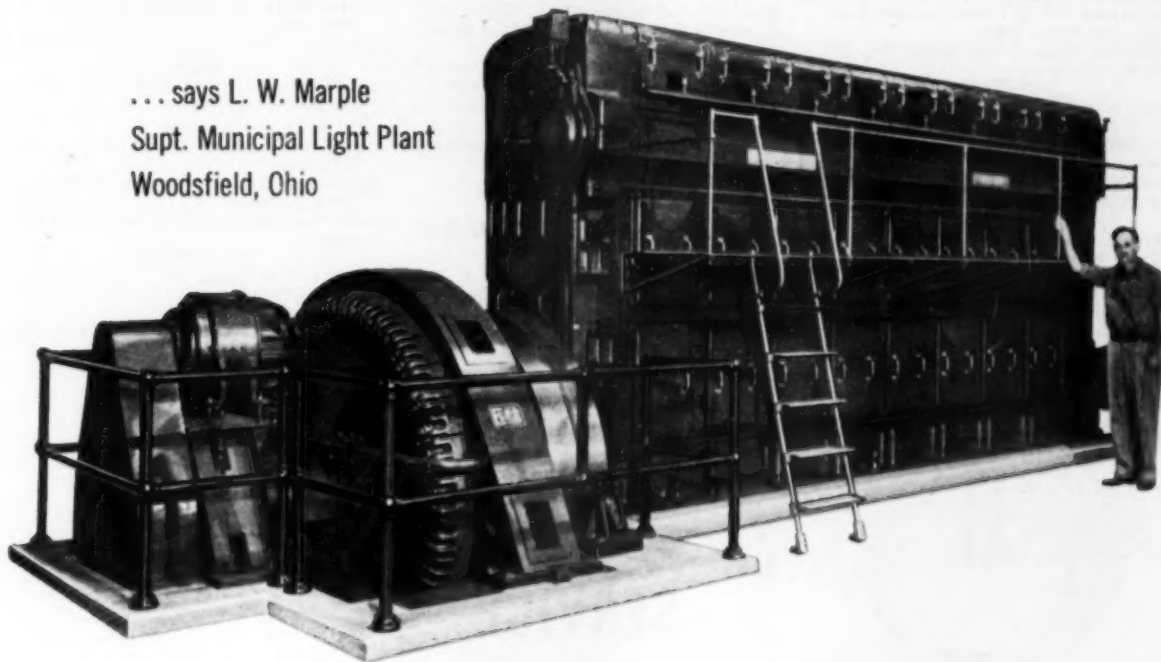
Yes, the GM Diesel is truly a "logger's engine"—designed and built to take the toughest jobs in stride. For an eye-opening analysis of how this modern Diesel can step up your production and cut your costs on any job, call in your GM Diesel distributor or write direct to us.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICH.

Single Engines 16 to 275 H.P.
Multiple Units Up to 840 H.P.

"No More Sticking Rings..."

... says L. W. Marple
Supt. Municipal Light Plant
Woodsfield, Ohio



• "Because of the lubricating oil we were previously using," says Mr. Marple, "sticking rings and carbon build-up were persistent problems on our three Fairbanks-Morse Model 32-E diesels.

"Three years ago, at the recommendation of one of your lubrication engineers, we switched to Sinclair GASCON® Oil D—HD.

"GASCON D—HD has cleared up our troubles... no more sticking or broken rings... no more carbon build-up, even though our load factor has increased. The result is a considerable savings in maintenance costs.

"We are also getting outstanding results with GASCON in our new 875 H.P. National Superior Dual Fuel Engine."

Perhaps a Sinclair Lubrication Engineer can solve *your* lubrication problems. Call your local Sinclair Representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR

DIESEL

LUBRICANTS

save wear and replacements

ARIZONA

Phoenix, Charlie C. Jones Battery & Elec. Co., 300-322 West Jefferson St.

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Los Angeles 21, Magneto Sales & Service Co., 751 Towne Avenue
 Sacramento, Langner & Rifkin, 1116 15th St.
 San Diego 1, Elec. & Diesel Service Co., 1254 Kettner Blvd.
 San Francisco 3, Furrer & Uster, Inc., 225-7th St.
 San Francisco 3, H. G. Makelim Magneto Repair Co., 1583 Howard Street
 Wilmington, Diesel Control Corporation, 218 North Marine Ave.

COLORADO

Denver 3, Central Supply Co., 1171 Lincoln Street

FLORIDA

Jacksonville 1, Spencer Electric Co., Inc., 40 West Beaver Street
 Miami 36, Florida Diesel Service Co., 1930 North Miami Ave.

GEORGIA

Atlanta 3, Auto Electric & Magneto Co., 477 Spring Street, N. W.

ILLINOIS

Chicago 16, Illinois Auto Electric Co., 2011-37 Indiana Ave.
 Rock Island, Lohse Automotive Service, Inc., 430 North Capitol Ave.

MISSOURI

Kansas City 8, Electrical & Magneto Service, Inc., 2538 Grand Avenue
 St. Louis 23, Diesel Fuel Injection Service Co., 9331 South Broadway

NEBRASKA

Omaha 2, Carl A. Anderson, Inc., 16th and Jones St.

NEW JERSEY

Newark 2, Tire Trading Co., 239 Halsey Street

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Brooklyn 32, A&D Diesel Service, Inc., 145-21st St.
 Brooklyn 16, E. A. Wildermuth, Inc., 1102 Atlantic Avenue
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 Syracuse 4, F. A. Crossman, Inc., 943 Genesee St.
 Troy, Ehrlich Electric Service, Inc., 200 Fourth St.

NORTH CAROLINA

Raleigh, Diesel Injection Service, 3015 Hillsboro Road

TEXAS

Corpus Christi, Womack Bros., 1302 Caldwell
 Dallas, Beard & Stone Electric Co., 3909 Live Oak Street
 El Paso, Reynolds Battery & Magneto Co., 801 Myrtle Ave.
 Houston 1, Beard & Stone Electric Co., Milam at Polk Street
 Houston 11, Magneto & Diesel Injector Service, 6931 Navigation Blvd.
 Odessa, Electric Service & Supply, 1601 North Grant Street
 San Antonio, Womack Bros., 123 West Carolina

UTAH

Salt Lake City 2, Diesel Electric Service & Supply Co., 58 East 7th, South

VIRGINIA

Norfolk, Diesel Injection Sales & Service, 808 Union Street
 Richmond 20, Charles H. Woodward Electric Co., 709 Broad Street
 Salem, Diesel Injection Sales & Service, 814-8th Street

WASHINGTON

Seattle 1, Seattle Injector Co., 2706 Second Ave.
 Seattle 14, Sunset Electric Co., 300 Westlake, North
 Spokane 8, Sunset Electric Co., North 703 Division Street

DIRECTORY OF SERVICE STATIONS IN U.S.A.



A NATION-WIDE Authorized SERVICE ORGANIZATION

Bendix

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Newton Upper Falls, W. J. Cornell Co., 210 Needham St., Newton Industrial Center

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Detroit 2, Knorr-Maynard, Inc., 5743 Woodward Ave.

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Minneapolis 6, Diesel Service Co., 2509 East Lake Street
 Minneapolis 2, Reinhard Bros. Co., Inc., 11 South 9th Street

OHIO

Cleveland 14, Cleveland Ignition Co., 1301 Superior Ave., N. E.

OKLAHOMA

Tulsa 3, Magneto Ignition Co., 701 West 5th St.

OREGON

Portland 14, Automotive Products, Inc., 1700 Southeast Grand Ave.

PENNSYLVANIA

Hazleton, Penn Diesel Service Co., No. Church at 27th St.
 Philadelphia 32, J. W. Parkin, Jr., 2251 North Broad Street
 Pittsburgh 13, Automotive Ignition Co., 6358 Penn Avenue

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Memphis 4, Automotive Electric Service Co., 982 Linden Ave.

WISCONSIN

Milwaukee 2, Wisconsin Magneto Co., 918 North Broadway

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Calgary, Hutton's, Ltd., 131-11th Avenue, West

BRITISH COLUMBIA

Vancouver, Magneto Sales & Service, Ltd., 126 Gore Avenue

NEWFOUNDLAND

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QUEBEC

Montreal, International Electric Co., 1037 Bleury Street

Alaska

ALASKA, TERRITORY OF
 Anchorage, Reeve Alaska Automotive, Merrill Field, P.O. Box 1160

SCINTILLA MAGNETO DIVISION of SIDNEY, NEW YORK

Bendix

AVIATION CORPORATION

Western Office: 582 Market Street, San Francisco 4, California • Export Sales: Bendix International Division, 205 East 42nd Street, New York 17, N.Y.



Designed by Tams, Inc. and built by Jakobson Shipyard, Oyster Bay, L. I., the *Bumble Bee* is powered by a General Motors Model 16-278A Diesel engine.

ANOTHER GM DIESEL IN NEW YORK HARBOR

The BUMBLE BEE is the second new tug, with General Motors Diesel-Electric Drive, delivered recently to The New York, New Haven & Hartford Railroad.

These modern tugs will provide the best possible equipment for the vital job of linking New England's rail arteries with national rail systems ter-

minating in New Jersey. New Haven officials say, "The greater power, efficiency and dependability of the new tugs will help to insure rigid adherence to the railroad's freight delivery schedules."

Where close schedules have to be maintained, economical, dependable General Motors Diesel-Electric Drive is first choice today.

CLEVELAND DIESEL ENGINE DIVISION

GENERAL MOTORS • CLEVELAND 11, OHIO

ENGINES FROM 150 TO 3250 H.P.



Tie Up to GM Service

Sales and Service Offices: Cambridge, Mass. • Chicago, Ill. • Miami, Fla. • New Orleans, La. • New York, N. Y.
Norfolk, Va. • Orange, Texas • San Francisco, Calif. • Seattle, Wash. • St. Louis, Mo. • Toronto, Ont.
Vancouver, B. C. • Washington, D. C. • Wilmington, Calif.



YOUR **PROOF** OF EFFICIENCY

HOFFMAN FILTERS Deliver Dependable, Low-Cost Service for Power Generating Plants Like These:

WOLVERINE ELECTRIC COOPERATIVE, INC. — At the Johnson Plant in Hersey, Mich., which won the 1953 "Diesel Progress" Efficiency Award, Hoffman Cartridge Filters and 300 g.p.h. Oil Conditioner contribute to lube and fuel oil clarity. Shown above is the Hoffman oil conditioner unit used for batch purification of lube oil. Soluble contaminants are driven off by the vaporizer in this unit and abrasive solids are removed by its cartridge filter component. In addition, three Hoffman Cartridge Filters, with 7x18 throwaway cellulose cartridges, serve each of the Fairbanks Morse 3,500 H.P. engines with lube oil on a by-pass basis. A fourth Hoffman filter handles fuel oil for these machines.

IOWA POWER & LIGHT CO. — For its program of preventive maintenance covering 24 substations in a territory radiating 150 miles from Des Moines, this company uses a 300 g.p.h. Hoffman Oil conditioner mounted on a truck chassis. Transformer and circuit breaker oils can be quickly restored to safe operating limits in this manner. The reclaiming is quickly connected to the equipment. It is easily operated — requires no highly skilled or trained technical personnel. The Hoffman oil conditioner has demonstrated year-round dependability in this company's campaign against oil sludging and oxidation.

CORN BELT POWER COOPERATIVE, Humboldt, Iowa — Since 1950, this truck-mounted Hoffman Oil Conditioner has traveled this system's 12,344 miles of transmission lines to keep transformer and circuit breaker oils at safe operating levels. This method has proved convenient, quick and economical. The 300 g.p.h. conditioner is quickly connected to equipment for recirculation of oils through the filter using Fuller's earth to remove solid particles of carbon, products of oxidation such as organic acids, gums, resins and asphaltines resulting from operation of the transformer at high temperatures. Filtered oil then passes through a vaporizer which dehydrates and degasifies the oil to produce an end-product free from oil contamination and moisture and having safe dielectric strength limits.



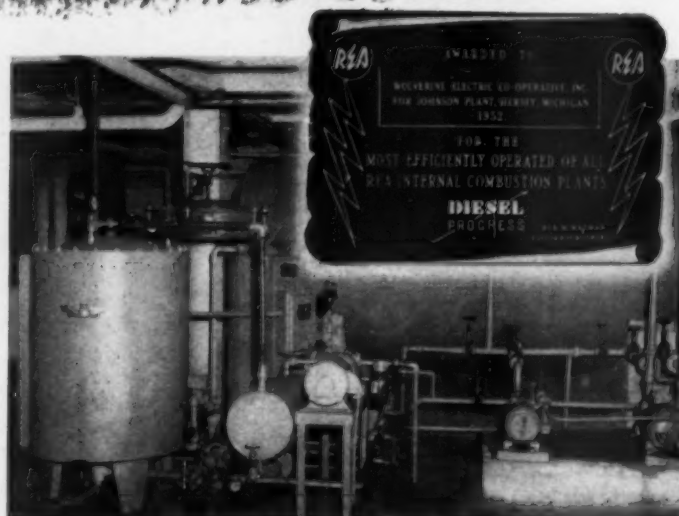
The HOFFMAN FLO-master

A full-flow filter to remove lube oil abrasive particles down to 20 microns or smaller. Minimum initial pressure drop. Exclusive throwaway cartridge with 45 sq. ft. of filter area. Sizes from 75 to 900 g.p.m. Write for Bulletin A-873.

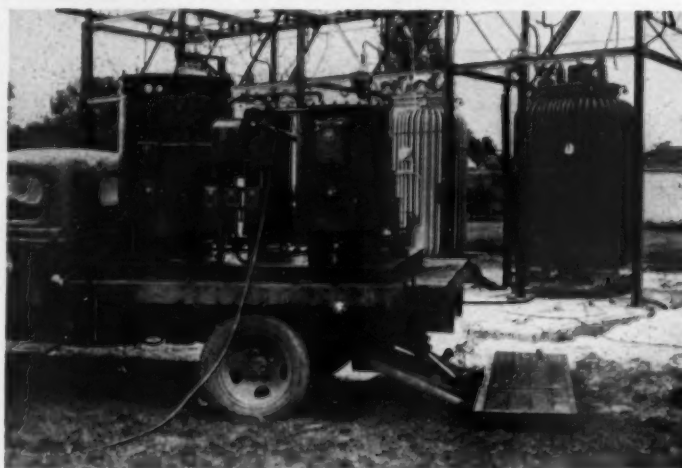
HOFFMAN Cartridge FILTERS, 7x18 or 11x18 cartridges. Repackable or throwaway types—cellulose or Fuller's earth. By-pass or intermittent operation—lube or fuel oils. 3 to 480 g.p.h. capacities. Write for Bulletins A-888 and A-649.



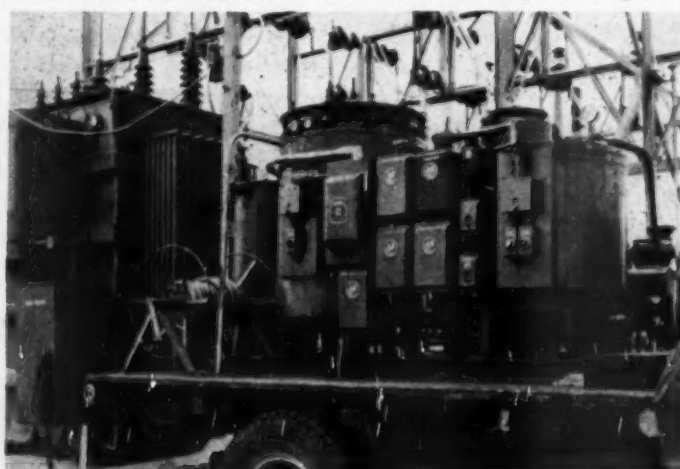
HOFFMAN Oil Conditioners. Complete reclamation of used oils. Remove both soluble and insoluble impurities. Capacities for 25 to 600 g.p.h. Write for Bulletin A-667.



Hoffman 300 g.p.h. oil conditioner for lube oil reclamation.



Iowa Power & Light mobile unit for reconditioning insulating oils.



Hoffman Oil Conditioner, as "mobilized" to recondition insulating oils for Corn Belt Cooperative.

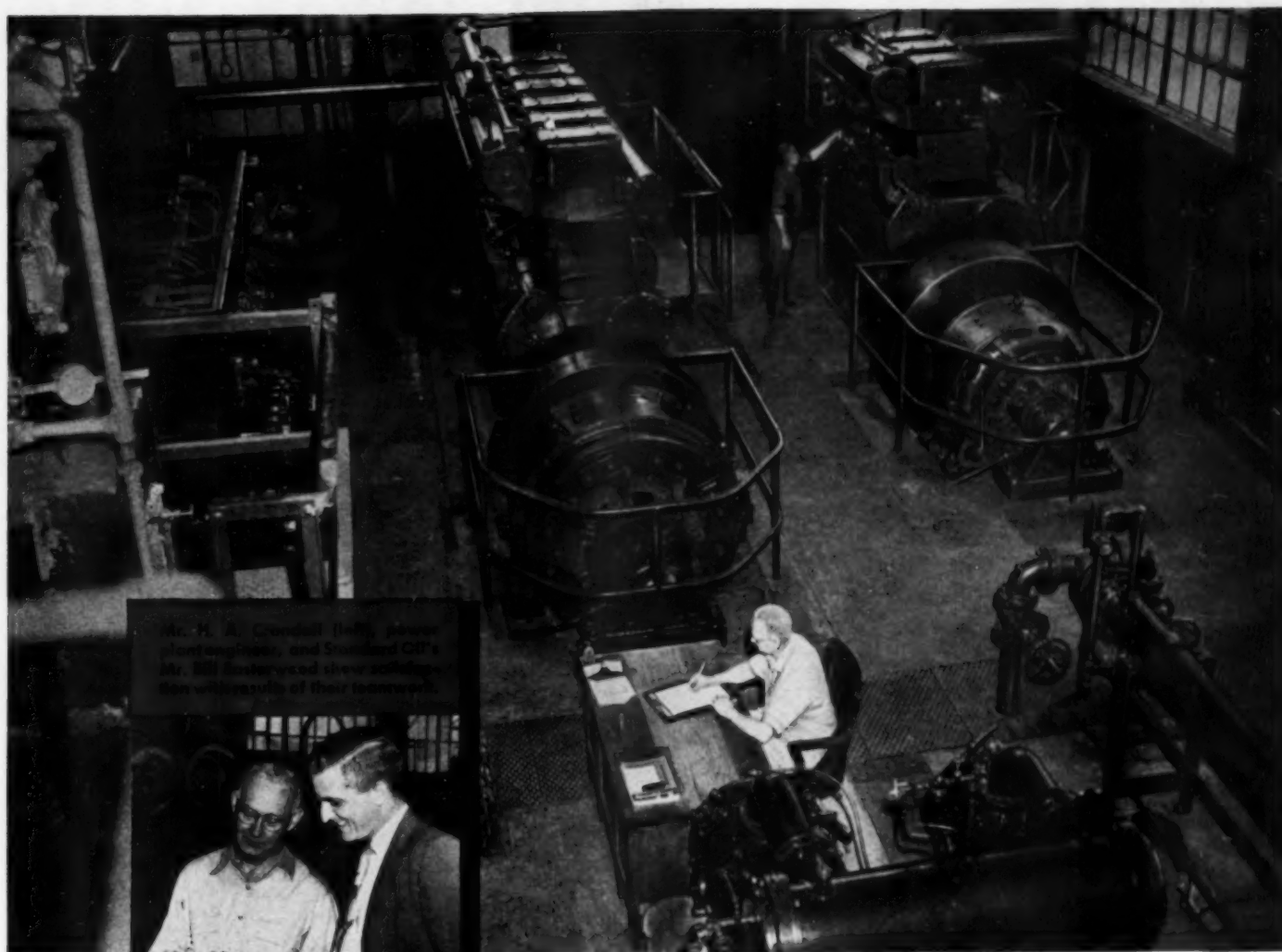
IN CANADA:
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U. S. HOFFMAN MACHINERY CORPORATION

137 LAWRENCE STREET, STROUVER, N. Y.



Mr. H. A. Crandall (left), power plant engineer, and Standard Oil's Mr. Bill Foster stand close together, discussing the operation of their engines.

Here's a 27,000-hour record for low wear and clean operation!

● This diesel power plant serves the American Locomotive Company's Steel-Spring Division works at Chicago Heights, Illinois.

The plant superintendent was increasingly aware that lubrication of his two diesels was not all that it should be. There was trouble with stuck rings, and crankcases showed excessive deposits. Working with a Standard Oil lubrication specialist, the superintendent switched his engines to STANDARD HD Oil.

During some 27,000 hours' operation of each unit, engines have remained exceptionally clean. Ring sticking troubles have been eliminated. Cylinders have shown less than 0.01" wear — a reduction of 50% over the previous, similar period. Neither of the original fills of STANDARD HD have needed to be replaced.

Midwest diesel operators are getting record efficiency and economy with the help of STANDARD HD. Your Standard Oil lubrication specialist can help you get similar results. Phone your local Standard Oil office. Or, write: Standard Oil Company, 910 South Michigan Ave., Chicago 80, Ill.

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TRADE MARK
OIL

STANDARD OIL COMPANY



(Indiana)

**"CENTRIFUGED
HEAVY FUEL OIL
SAVED US
*\$4500 A MONTH"**

***Robert Dodd, Chief Engineer
Clay Electric Co-op**



"At our Keystone Heights, Florida, plant we have been burning residual fuels in our diesel engines for well over two years. We use a straight residual fuel and enjoy the full differential between its cost and No. 2 fuel. All fuel is centrifuged in a De Laval Heavy Fuel Oil Purifier. This centrifuge removed dirt from the heavy fuel at the rate of 13 to 15 pounds per 5 hours of operation.

"As a result of burning this De Laval centrifuged heavy fuel, we saved up to \$4500 per month . . ."

De Laval Heavy Fuel Oil Purifiers are ideally suited to preparing heavy fuel for burning. They are designed so that purification takes place at a constant rate; there is no reduction in separating efficiency until the entire dirt holding space is full of solid material. This one feature alone makes it the outstanding means of cleaning up residual oil and enjoying the profits that such operation can bring.

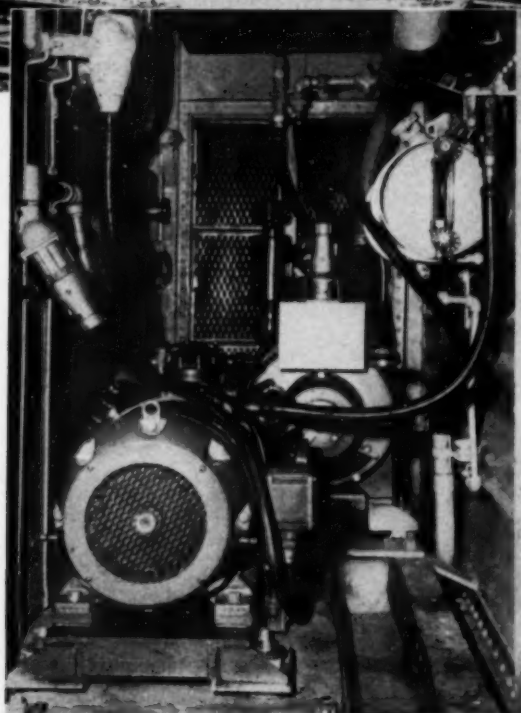
DE LAVAL



THE DE LAVAL SEPARATOR COMPANY
Chicago POUGHKEEPSIE, N.Y. San Francisco

HEAVY FUEL OIL PURIFIERS

Electric Power by ONAN on MTC's freezes, ventilates, defrosts and controls



Side view of engine bulkhead showing motor and compressor with generating set in background. Note condenser unit mounted in the ceiling with engine radiator above it.

Versatile electric power—25,000 watts of it, runs Santa Fe's new Mechanical Temperature Control units now being performance-tested. The 30 cars are equipped with 25-KW generating sets of which ten are model 25 DCV-5E/344C, 25-KW Onan Electric Plants powered by IH Diesels. Another ten have Onan 25-KW generators run by Hercules Diesels. Each electric plant supplies power for one 15 HP, 3-phase, 220-volt electric motor for the refrigeration compressor, one 3 HP motor for the evaporator fan, one 5 HP motor for the fan which cools the engine radiator and con-

denser unit, and heating units (for defrosting) drawing 6-KW. The electric plants also supply vital power for the electronic "brain" which controls the entire system.

The Onan generators are designed to handle the heavy starting cycle overload of the motors, when from 5 to 6 times as much current is required as during running cycles.

If you have any problems involving the use of an independent source of electricity, whether it's for a new development like the MTC cars, or for any other application, consult our Engineering Department.

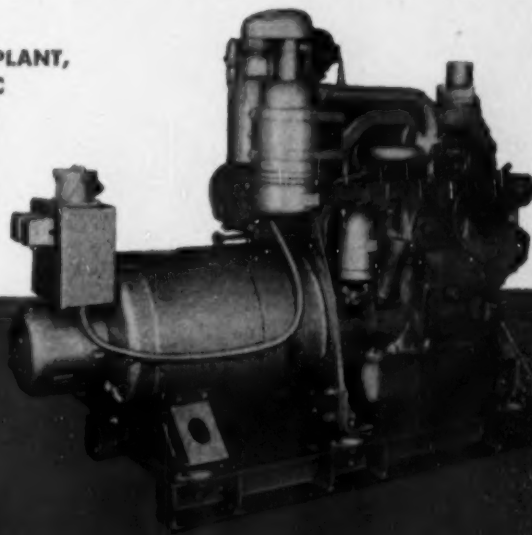


D. W. ONAN & SONS INC.

2380 University Ave. S. E., Minneapolis 14, Minnesota

ONAN DIESEL ELECTRIC PLANT, MODEL 25 DCV-5E/344C

This unit is used in 10 of the MTC cars. Generator is revolving field type, self-excited and inherently regulated, 25-KW, 220-volt, 60-cycle, 3-phase. Engine is International Harvester Diesel, UD-9A.

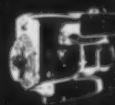


OTHER ONAN ELECTRIC PLANTS FOR RAILROAD APPLICATIONS

Displacement—2,000 to 55,000 cubic inches; Horsepower—400 to 500



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Track maintenance



Warehouse lighting

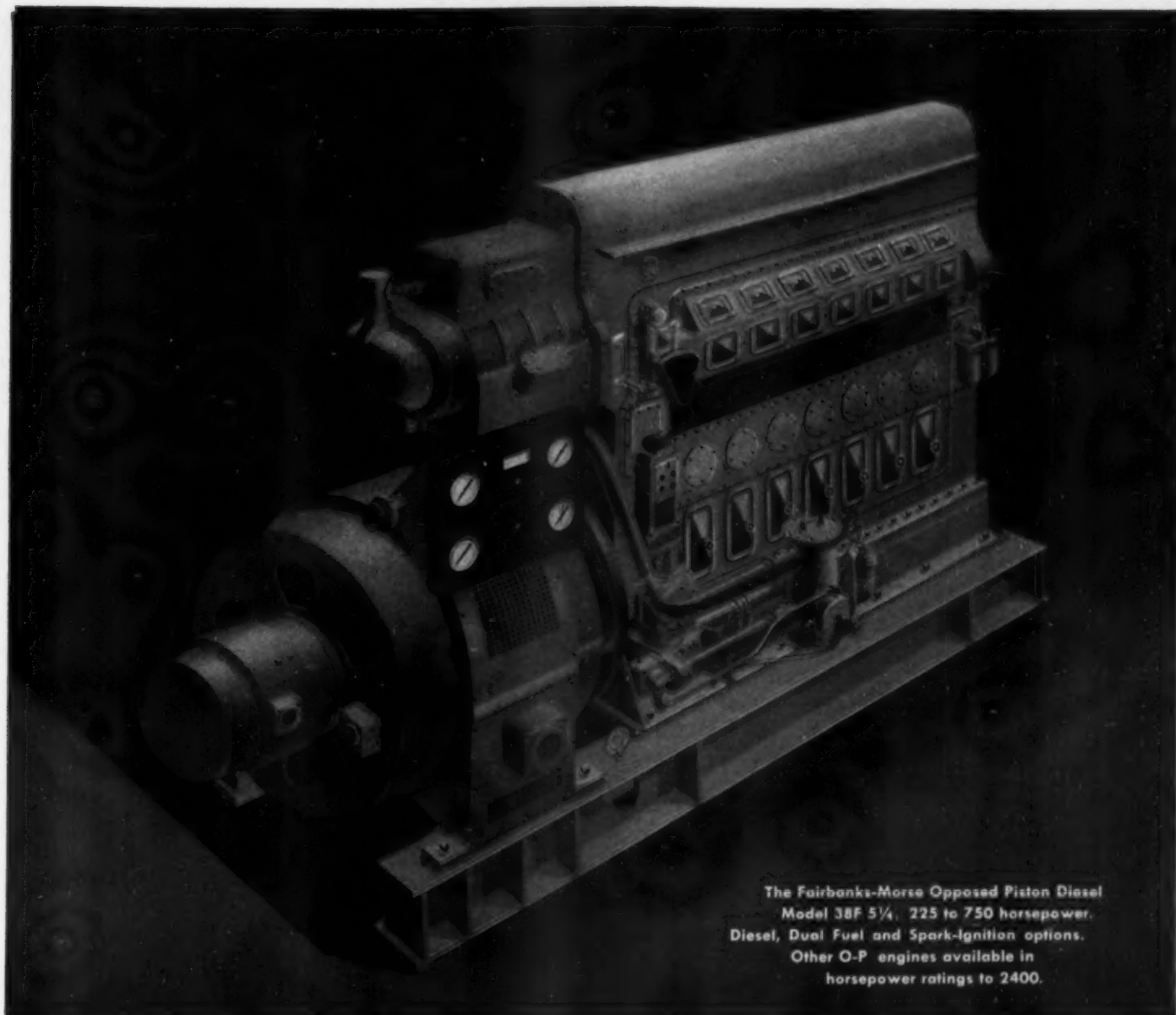


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greatest name in diesel fuel injection...

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Look to American Bosch
for continued leadership
in diesel fuel injection.



The Fairbanks-Morse Opposed Piston Diesel
Model 38F 5 1/4. 225 to 750 horsepower.
Diesel, Dual Fuel and Spark-Ignition options.
Other O-P engines available in
horsepower ratings to 2400.

...always a need for something *Finer*

It was designed and built without thought of price... built only to give the maximum of heavy-duty horsepower in a minimum of space... plus an unvarying reliability upon which you could stake a balance sheet of operating costs and profits.

The price?

Not quite as low as conventionally designed and conventionally manufactured engines, but low enough to

insure that no one who wants and needs an engine which gives more, need forego its ownership. For the more difficult tasks of producing power, this engine is a fulfilling answer.

Fairbanks, Morse & Co., Chicago 5, Illinois.



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a name worth remembering when you want the best

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...with TYCOL lubricants on hand!

It pays to buy a "Diesel-Designed" Lubricant! ... It takes "something more than a motor oil" to counteract excessive wear in Diesel engines — and we proved it with Tycol Adeltran 401. In this instance, a Diesel engine was operated for one year with a competitive oil. An overhaul by the manufacturer turned up these conditions: all liners had to be replaced as well as piston rings ... 2 top compression rings were stuck and all rings were gummed up. After the switch to Adeltran (for the same operating period) liner wear was negligible ... filter life was considerably extended ... all rings were free and in excellent condition ... and owner reported an exceptionally clean engine base. For full details on Adeltran, contact your local Tide Water Associated office!

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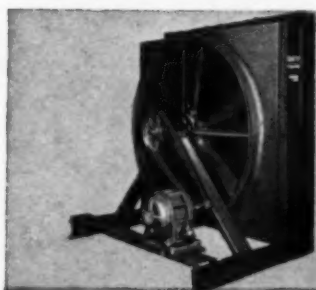


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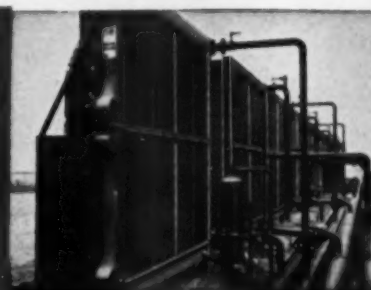


Use Them Individually or in Combination...

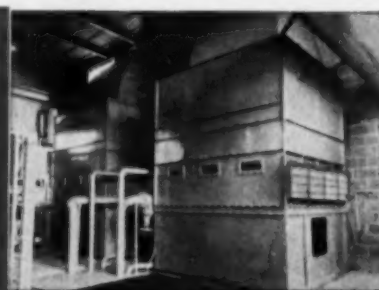
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Are ALL Engineered to Work Together



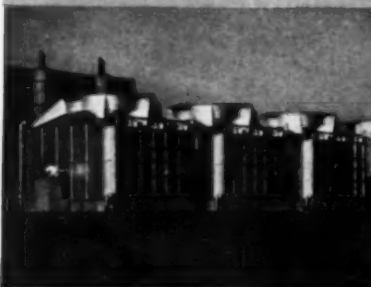
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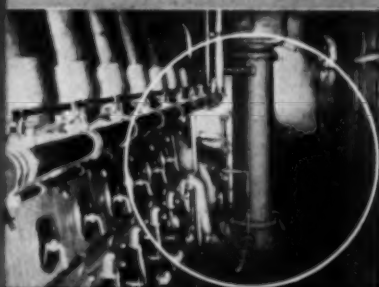
**Evaporative Cooling
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Self-contained units in six basic models, with single or two-coil assemblies. Sectional design provides versatility, ease of handling. Used primarily for cooling Diesel engine jacket water and lube oil.



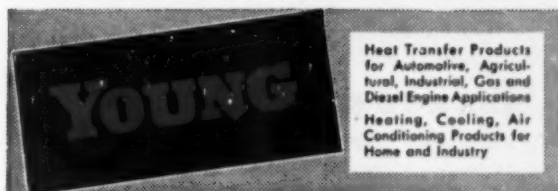
**"VAD" Cooling and
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Vertical air discharge permits compact multiple unit installations without loss of efficiency due to cross winds. Low-level mounting, low-cost installation, easy inspection and maintenance are features.



**"HC" Cooling and
Condensing Units**
Horizontal core construction with vertical air discharge. Rugged structural design; wide choice of cores; complete with fans, power plants and controls. In single or multiple type units.

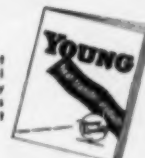


**Shell and Tube
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Available in 690 standard models, single to four-pass, fixed and removable tube bundles. Unusually close-tolerance construction assures maximum cooling with minimum weight. Calculator available.



Leaders in Heat Transfer Engineering for more than 25 years

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Aeroquip

*"little gem" fittings**



aeroquip did it again!
**Another Important Development
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- CLAMPING ACTION, between nipple and socket, is exerted on reinforcing wire braid only.
- POSITIVE LIP SEAL is formed by end of inner tube in annular chamber.

Here's another great Aeroquip first . . . *"little gem"* Fittings with radically new features never before seen in the industry! These amazing new fittings were especially designed to prolong the life of certain types of hose made of rubber or rubber-like materials, and plastics. Under extreme compression these materials tend to take a definite set and flow away from the zone of compression. This action is accelerated by heat. Through advanced research, development, and engineering, Aeroquip was able to provide the answer to this problem. *"little gem"* Fittings are now in production for Anti-Icing Hose Lines used on aircraft jet engines, and Steam Hose Lines in the industrial field.

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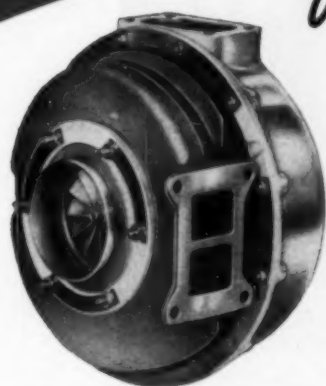
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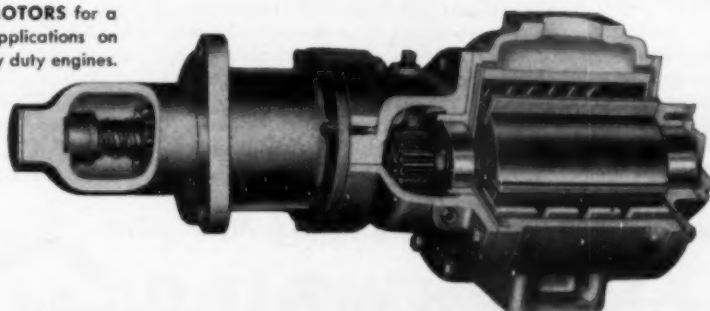


THERMATICALLY CONTROLLED COOLING FANS AND FAN DRIVES. Available for installation by owner on many makes and sizes of heavy duty engines.

POSITIVE DISPLACEMENT SUPERCHARGERS for engine sizes from 50 to 500 HP, naturally aspirated output, and pressure ratios of 2:1 max.



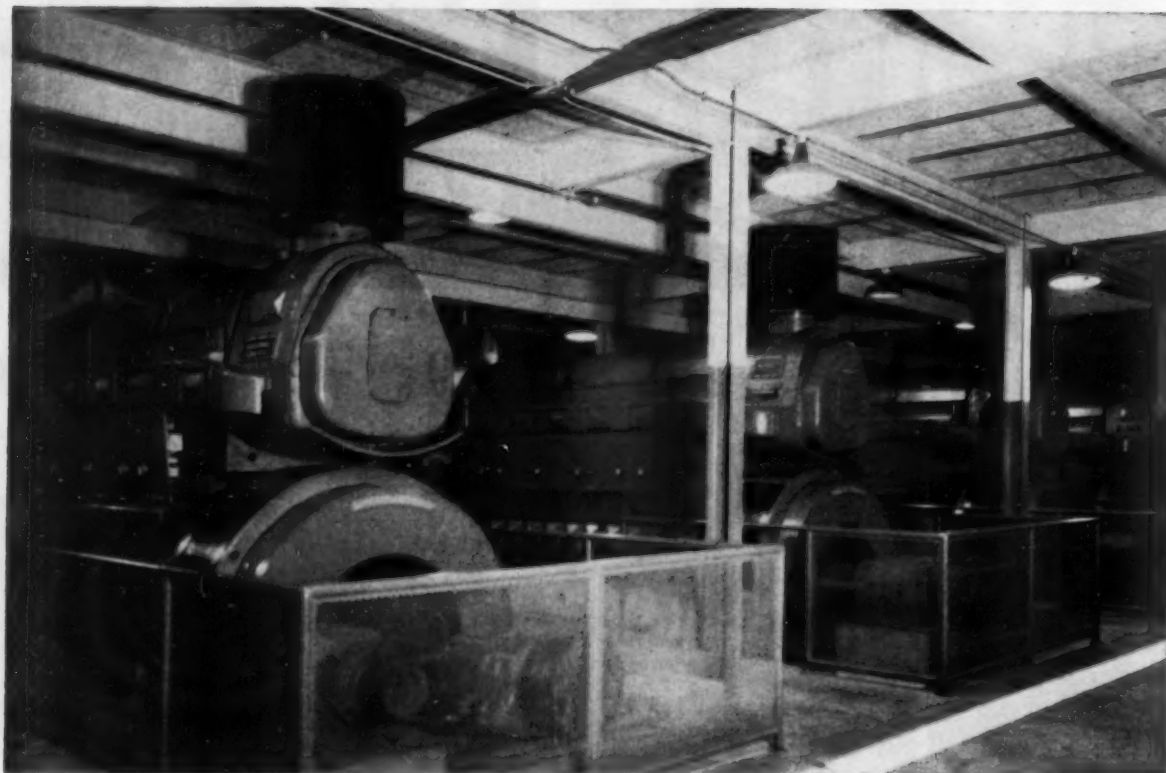
AIR STARTING MOTORS for a wide range of applications on many sizes of heavy duty engines.



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Air-Maze filters keep air clean for five Fairbanks-Morse diesels in Minnkota Power Plant

USED FOR PEAKING and standby service at the Minnkota Power Plant five Fairbanks-Morse diesels get dirt-free air from five Air-Maze Multimaze air filters.

Designed for heavy duty, the Multimaze filter offers low resistance to air flow but high efficiency in removing dirt and abrasive matter. It breaks up the air into thousands of minute currents, impinges air-borne dirt on a series of oil-wetted baffles.

By spacing the baffles to be progressively denser as air passes through the filter, larger particles are collected without blocking the filter surface, and the smaller particles are deposited on the denser sections. Available in capacities from 450 to 6000 CFM, the Multimaze is recommended

for industrial applications where greater dust holding capacity is important.

Air-Maze filters are available in both oil-wetted and oil-bath types. Either can be supplied with a specially designed acoustical chamber to overcome air intake noises.

With over 28 years experience and thousands of applications, Air-Maze, the filter engineers, have met practically every diesel filtration and silencing need. Air-Maze serves the industry with a complete line of intake silencers, oil-bath filters, lube oil strainers, fuel filters, and other products. For help with your filter problems, contact your nearby Air-Maze representative or write The Air-Maze Corporation, 25000 Miles Road, Cleveland 28, Ohio.

The biggest names in diesels are protected by Air-Maze filters

AIR FILTERS
SILENCERS
SPARK ARRESTERS

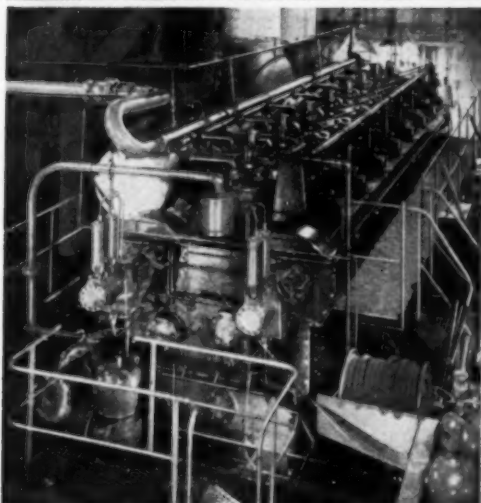
AIR-MAZE

The Filter Engineers

LIQUID FILTERS
OIL SEPARATORS
GREASE FILTERS

Captain E. C. Baganz of M.S. Eugene W. Pargny reports:

**"Our new Hamilton Diesel engine
gives us enough added power
and maneuverability
to cut trip time 10%"**



Pictured above is the 2-cycle, 8-cylinder, single acting, direct reversible Hamilton Diesel engine which replaced a less efficient 2050-hp jet-condensing, triple-expansion steam engine in 1951.

Here is Captain E. C. Baganz on the bridge of Pittsburgh Steamship's ore carrier M.S. Eugene W. Pargny which is shown below in service on the Great Lakes. It normally carries 14,000 long tons of ore from the head of Lake Superior to Lake Michigan or Lake Erie Ports and returns light.

Greater operating efficiency and maneuverability are two big advantages a Hamilton Diesel engine has given Pittsburgh Steamship during two years of service in their 600-foot ore carrier, Eugene W. Pargny. According to Captain E. C. Baganz, the 3570-hp, 21½ x 27½ Hamilton has made a "new ship" out of the 35 year old Pargny:

"MANEUVERABILITY is of prime importance to us, particularly when we must get the long, narrow ship through holes in breakwaters under severe, high wind storm conditions. The new Hamilton engine makes it a lot easier for us because it gives us more power ahead and astern.

"ECONOMICAL OPERATION of the Hamilton Diesel benefits us two ways. By substantially increasing our normal speed and maintaining a higher average speed it is enabling us to make more round trips to the ore fields per season compared with our previous average. Another advantage is the Hamilton Diesel's ability to burn any of the heaviest fuel oils. Except for short periods when starting or maneuvering in close quarters, this engine has been burning heavy residual fuels without unusual difficulty."

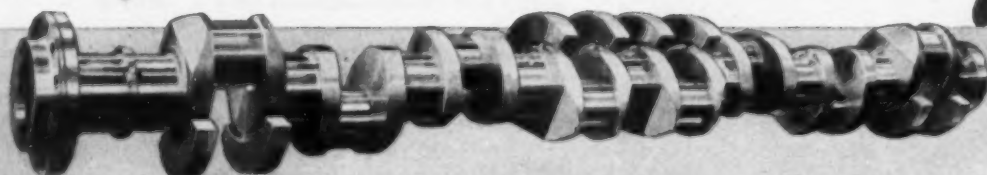


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BALDWIN-LIMA-HAMILTON



Will depend on **TOMORROW'S DIESELS**
ERIE FORGE CRANKSHAFTS



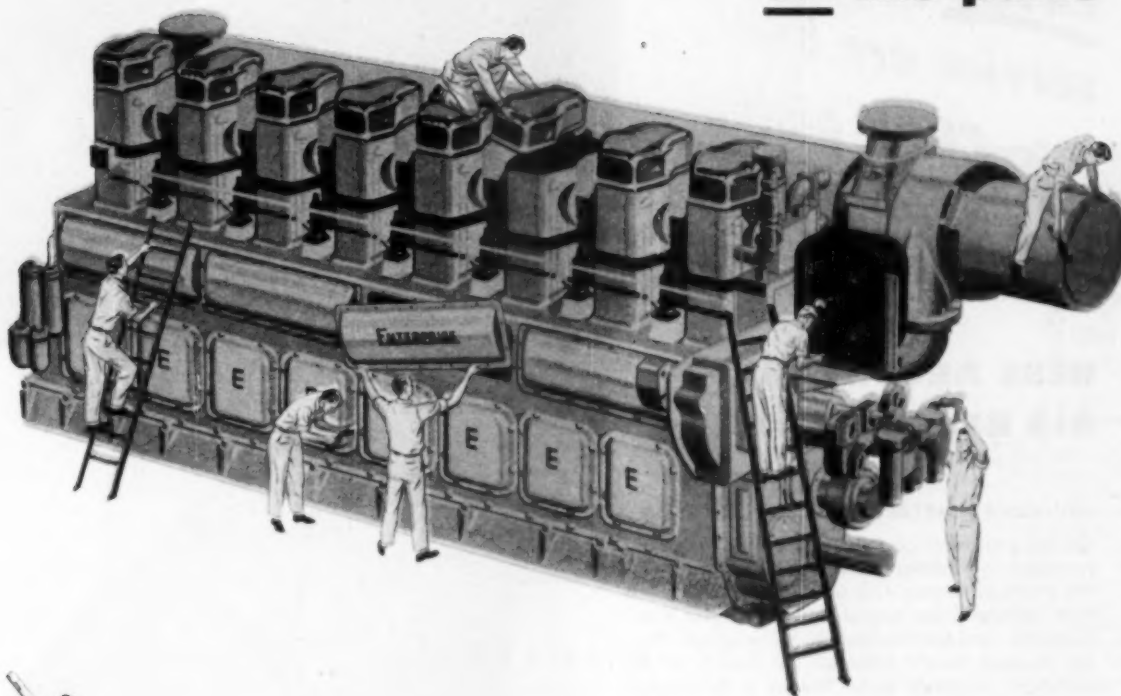
PRECISELY machined Erie Forge Crankshafts have, for many years, been synonymous with highest quality workmanship. At Erie Forge & Steel Corporation every step in production—from ingot to finished crankshaft, is under one control, one supervision. Every operation falls under closest scrutiny, thus assuring perfection in material specification, forging, machining and finishing. Today's diesels for industry, ships and locomotives depend on Erie Forge Crankshafts. Diesel engines of tomorrow will, too, because Erie Forge & Steel Corporation produces the finest forging you can buy.



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 ERIE, PENNSYLVANIA



It's easy to get to all the parts



**You'll find that ENTERPRISE accessibility
saves time, money and manpower
in maintenance and overhaul**



Check these points on "Easy-Access" ENTERPRISE Design

All major moving parts are enclosed with removable covers:

- ✓ Main and connecting rod bearings are fully accessible through large door plates on both sides.
- ✓ Cams, followers, camshafts and bearings are easily reached and removed.
- ✓ Cylinder head and rocker arm assemblies, push rods and fuel nozzles are easy to reach by removing oil and dust-proof covers.
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No bulky shrouds or surplus covers to remove before getting to engine.

Parts, accessories and controls requiring occasional inspection or servicing are externally mounted.

Ever watch precious hours slip by trying to find a way to dismantle, inspect or replace an engine part or assembly? Such unnecessary and costly down-time is something you don't have to worry about with modern, "easy-access" ENTERPRISE Diesels. For ENTERPRISE service-wise engineers have designed every model in the entire 73 to 2284 HP line for maximum accessibility and easy, low-cost servicing. That's why we say — and mean — you'll have less down-time if it's powered by an ENTERPRISE Dependable Diesel!

Write for descriptive bulletins, or call your nearest ENTERPRISE Diesel sales office.



ENTERPRISE ENGINE & MACHINERY CO.

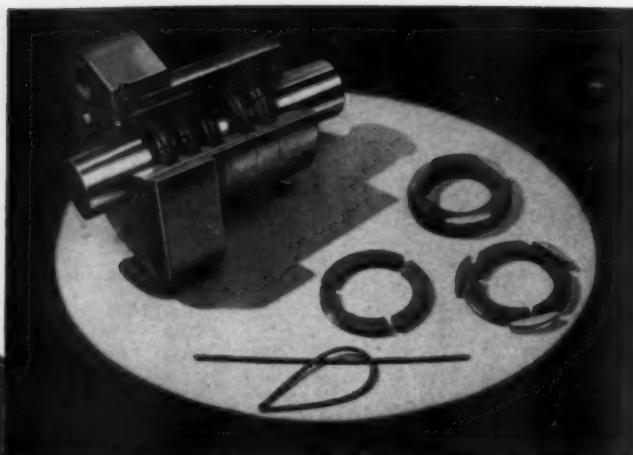
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into COOK piston
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ADVANCED METALLURGICAL TECHNIQUES

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FIELD RESEARCH and JOB ENGINEERING

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This combination of quality control, precision workmanship, rigid inspection, and "job-engineered" recommendations, is why you can count on years of efficient, trouble-free service when you use Cook piston rings and packings.

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SEALING PRESSURES SINCE 1888

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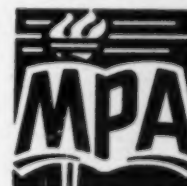


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DIESEL PROGRESS for November, 1953, Vol. XIX, No. 11. Published Monthly by Diesel Engines, Inc., 816 N. La Cienega Blvd., Los Angeles 46, California. Tel. BRadshaw 2-6273. Subscription rates are \$5.00 for U.S.A. and possessions. All other countries \$7.50 per year. Subscriptions may be paid the London office at £2-12s-6d per year.

DIESEL PROGRESS is indexed regularly by Engineering Index, Inc.

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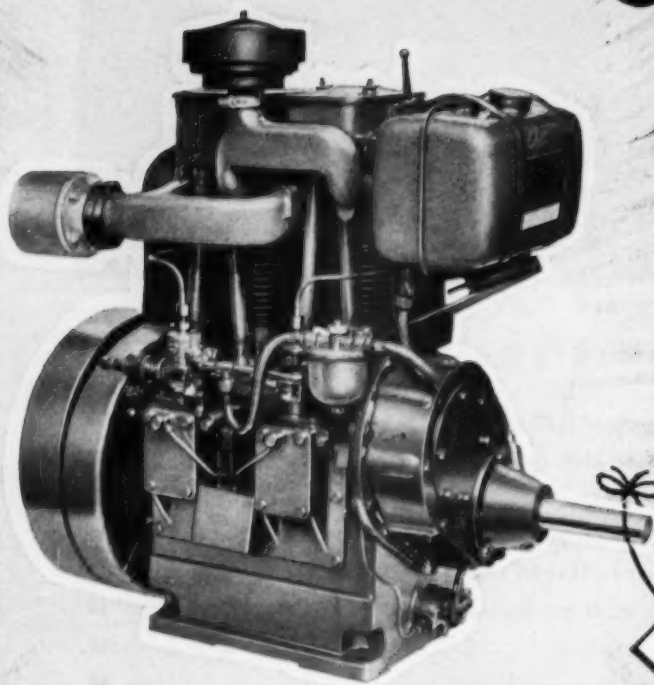
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A. & H. Shovel loading
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The Santa Fe Railway's new Mechanical Temperature Control (MTC) refrigerator car for transporting frozen foods. They are equipped with either GM Detroit Diesel, International or Hercules engines. Note diesel locomotive fuel tanks hung beneath car.

DIESEL-REFRIGERATED RAIL CARS

By JAMES JOSEPH

TO the housewife, the advent of frozen foods meant less work, less worry about the kitchen. To the shipper of perishables, particularly the railroads, frozen foods meant headaches and temperature control problems. Foremost among these was the inability of ice-salt cooling systems to guarantee reefer car temperatures as required by some frozen foods. Biggest troublemakers were the so-called low freezing-point commodities, citrus juices and fruits in syrup. These generally require in transit temperatures of about -10 degrees F.

Recently Santa Fe Railways unveiled the first of thirty, Mechanical Temperature-Controlled refrigerator cars—their cooling systems powered by diesel engines. The cars, equipped with a self-contained diesel plant, can hold -10 degrees F. and lower. Importantly, sub-zero temperatures can be maintained for as long as 12 days without refilling the four 100-gallon diesel fuel tanks located beneath the cars.

Three engine companies (General Motors, Hercules and International Harvester) and three air-conditioning manufacturers (Frigidaire Division of General Motors, Trane and Carrier Corp.) worked on the project. Each combination of engine and air conditioning manufacturer equipped 10 cars, al-

though basically all systems are the same. During shakedown tests, a temperature of -12 degrees F. was reached in seven hours, starting against an average ambient temperature of 58½ degrees. Minus 25-degrees was reached within twelve hours. Temperature-controlled cars are 50-ft. long, super-insulated and have a capacity of some 65 tons. Each carries its own, self-contained refrigeration system powered by an approx. 40 hp. diesel engine directly connected to a 25 kw., 220 volt, 3-phase, 60-cycle alternator. The alternator furnishes electricity to a 15 hp. at 1750 rpm., totally enclosed compressor motor. This motor drives a compressor rated 15-tons at 40-degrees suction and 105-degrees condensing. The compressor's capacity is 26,000 Btu's/hr. at minus 20-degrees evaporating, and plus 120-degrees condensing, saturated refrigerant temperatures, the design condition for these cars. Freon-12 is the refrigerant, the refrigeration system using about 35 to 75 lbs.

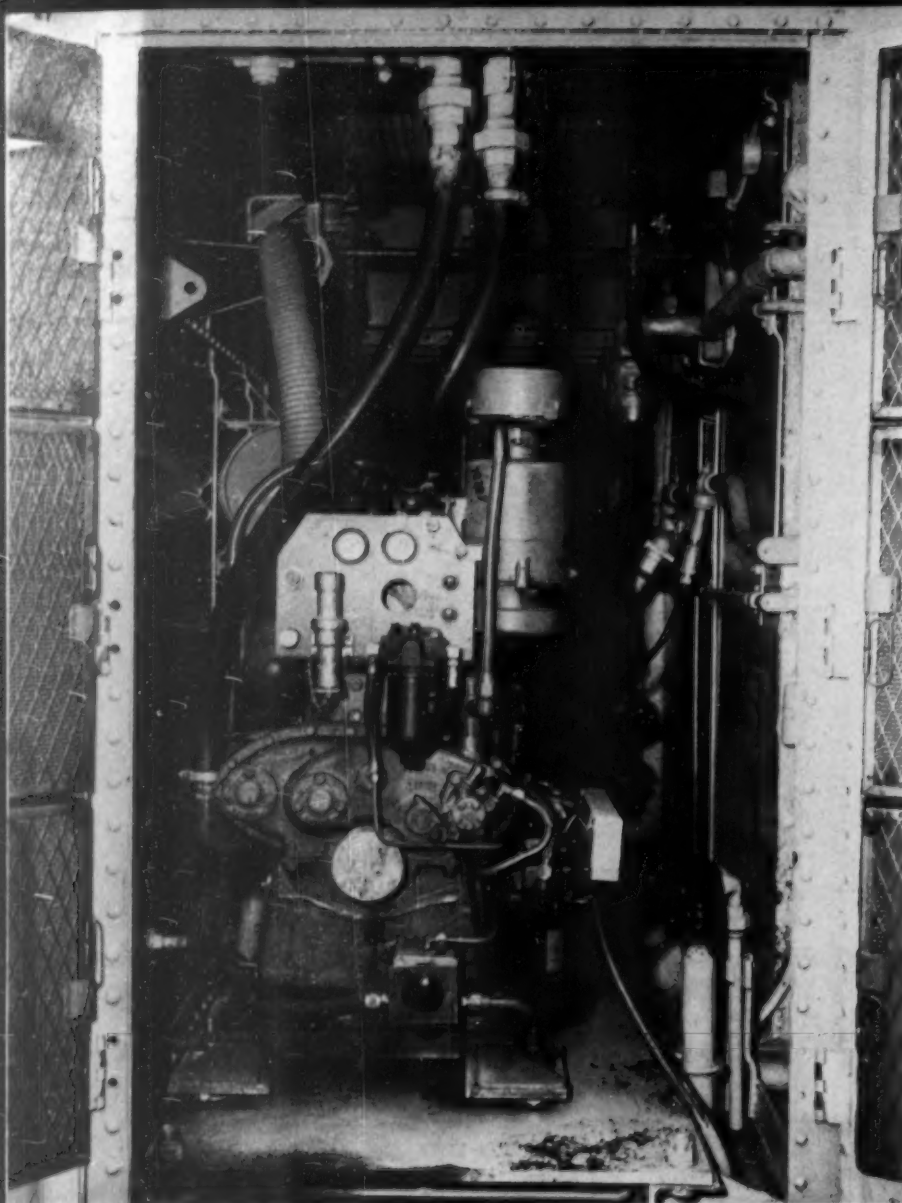
To meet Santa Fe's general specification for a minimum 40 hp. diesel engine to run off diesel locomotive fuel, the various engine manufacturers furnished: Hercules: Its Hercules DJXH, bore 3¾ in. x stroke 4½ in., 6 cylinder, 4 cycle, 298 cu. in. displacement, 52 hp. at 1200 rpm. Engine drives D. W. Onan alternator, 25 kw., 220 volts.

General Motors: Its Detroit 371—bore 4¼ in. x 5 in. stroke, 3 cylinder, 2 cycle, 213 cu. in. displacement, 45 hp. at 1200 rpm., driving a Delco alternator, rated 30 kw., 220 volts.

International: Its UD-9A, 4.4 in. bore, 5.5 in. stroke, 4 cylinder, 4 cycle, 334.5 cu. in. displacement, 52 hp. at 1200 rpm. Engine drives a D. W. Onan alternator, 25 kw., 220 volts.

Typical engine test: one Hercules has operated some 1500 hours. The longest sustained run was 267 hours during which the compressor and fan also operated except during the defrost cycle. Engineering was complicated by the extreme temperatures under which the diesels would operate. All engines have high temperature and low oil pressure protection. As an example, the Hercules DJXH and its 220 volt alternator power a Louis Allis, 15 hp., high torque, totally enclosed, 1750 rpm. compressor motor. In this combination, the compressor is a Trane B-516-L, bore 2½ in. x stroke 2 in., 6 cylinder, 59.6 cu. ft. per minute displacement, low lift valves, with a nominal rating of 40-degrees suction and 105-degrees condensing. Capacity: 15 tons.

In operation, the diesel engine, on rubber mounts, is located at one end of each car behind an insu-



Side view of the diesel engine, in this case a Hercules DJXH, which drives the Trane compressor in the MTC refrigerator car.

M. C. Moore, manager of Santa Fe's Calwa (Calif.) ice plant checking the Trane gauges at the control end of the car. This exterior Trane control panel monitors the interior temperature and engine operation.

its blowers stop, and the electric heaters, built into the coil assembly, become operative. A timer, likewise started by the differential pressure switch, terminates the cycle, restores refrigeration. Some 7,000 cubic feet per minute of standard air, at one inch static pressure, provide both engine cooling and the condensing medium. Air is drawn through both sides of the car past dynamic grilles and panel filters, upward through the condenser (and the diesel's radiator). Finally, air is discharged vertically through a single roof hatch by an exhaust fan driven by a 5 hp. motor. This circulation route avoids adverse effects of side winds; also, the air blast is vented through the roof at a high level, rather than at low level where it might prove objectionable.

The engine's above-condenser radiator is the copper fin and tube type with a total surface area of 292 sq. ft. Its capacity is 9 gallons of water and ethylene glycol, 50%-50%, assuring protection to approximately -50 degrees. Lube oil is Delvac S230, which has a low pour and is highly detergent. Diesel locomotive fuel oil is burned by the diesels. As a matter of fact, under-car fuel tanks are not heated. This may be necessary later, although cross-country tests, even in cold weather, have not indicated need for fuel-oil warming. A 24-volt battery, likewise rigged beneath the car, starts the engines and also operates some of the associated circuits, particularly protective.

Diesel protective devices include: (1) high water temperature shut-off if radiator water temperature exceeds 220-230 degrees F., as measured by an ele-

lated bulkhead with the engine compartment being slightly larger than formerly required for one ice bunker. In the same compartment are: compressor and its motor; a horizontally mounted condenser; the engine's radiator which is mounted above the condenser and incorporated in its frame; evaporator blower motor and other associated equipment. Refrigerated air is discharged into a shallow plenum chamber formed by a false ceiling. This ceiling, hung about 5-inches below the regular ceiling, is perforated with 660, equally spaced, one-inch diameter holes. Perforations provide a kind of pressurized distribution system. Some air percolates through the load while the remainder flows down side wall spaces (which act as flues) to return under the floor racks to the cooling coil. Thus the load is completely surrounded by a moving "film" of cold air.

One interesting feature, other than the diesel engine, is the automatic defrost, so regulated that defrosting does not materially warm the load space. To achieve this, some 6 kilowatts of defrost heat are provided for quick defrost. The defrost cycle is automatically initiated via a differential pressure switch, connected to pressure sensing taps, one below, the other above the evaporator coil. When a frost accumulation impairs the coil's performance thus causing lower suction pressures and reduced air flows, the air pressure drop across the coil increases, actuating the switch. The compressor and

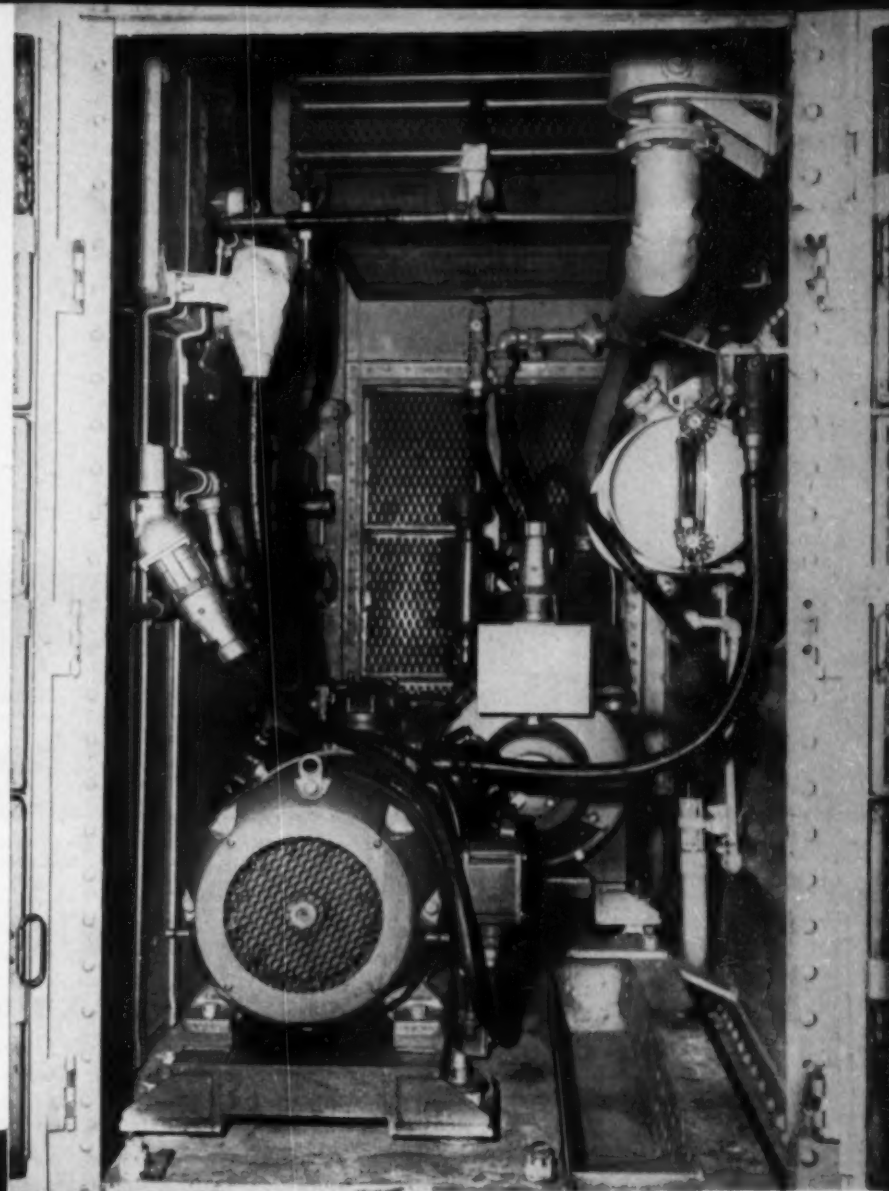


ment in the water jacket; (2) low oil pressure: this switch can be by-passed during starting by pressing a "hold" button on the control panel mounted outside the car; (3) low-voltage protection also by-passed during starting; (4) insulation between the engine room and the cargo compartment protects the cargo space from engine heat. Insulation between cargo space and engine bulkhead is 6-inches of plywood and Rubatex, a kind of sandwich, the 5-inch thick insulating material held between two 1/2-inch sheathes of plywood. A small day tank in each engine compartment holds a half gallon of fuel oil. The International UD-9A diesel is equipped with a Walker silencer, the other two units with Maxim.

Both cargo temperature and engine operation are monitored exteriorly from a control panel. The panel's brown light indicates a defrost cycle; white light, that the generator is operative. The panel also shows the battery's dc. amperage and the diesel engine's run-hours. Close at hand is an interior temperature indicator, and engine "start"-stop buttons. The system, as tested by prototype car #RD1200, was designed to withstand extreme weather conditions and shocks inherent in car handling. Functionally, refrigeration had to be able to: (1) precool a hot load of produce in accordance with accepted practices, that is, averaging six tons of refrigeration the first 24-hours; (2) maintain frozen load at minus 10 degrees even against extreme ambient temperatures; (3) carry a load at the most desirable temperatures and humidities according to best cold storage practice for produce ranging from chilled meats to bananas.

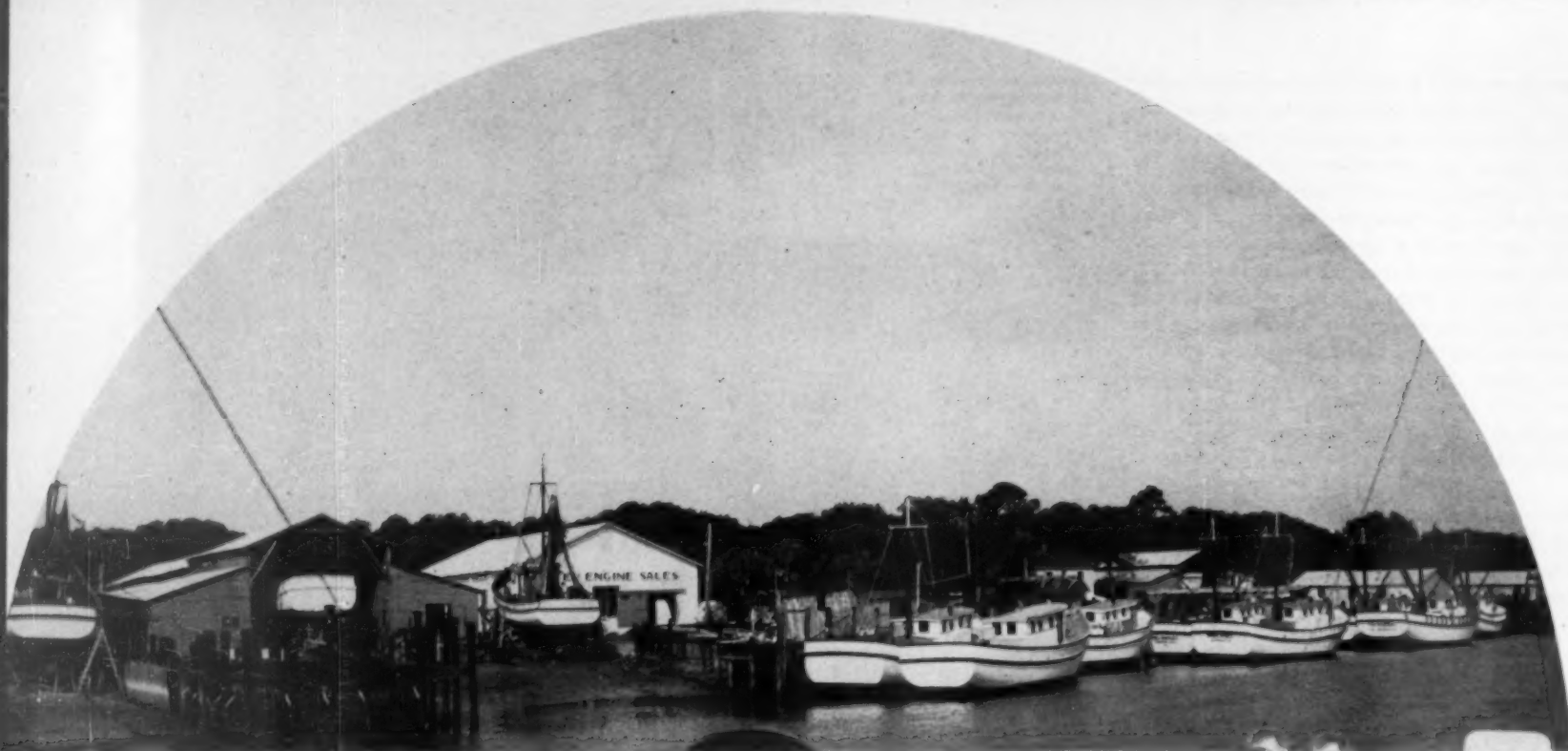
In the foreground, a Louis Allis compressor motor direct connected to a Trane compressor. In the background, an Onan 25 kw. generator direct connected to the Hercules diesel.

Sandy G. Moor, general foreman of the Santa Fe Calwa ice plant demonstrates the working of the flooring in the car's interior. Air forms a cold film around the cargo, circulating down sides and under metal rack flooring.



How well do Santa Fe's new diesel-run refrigerated cars accomplish all this? Let's look at some prototype test data. (1) The refrigerator test car coasting at 10 mph., with its equipment operating was permitted to strike five cars loaded with steel plate. There was no damage to the mechanical unit. (2) Conducted from Riverside, California, was the first road test involving a standard load of oranges at an average initial temperature of 64-degrees F. Desired average temperature was 40-degrees F. An average temperature of 45-degrees was reached in about seven hours and the temperature was 38.7 degrees upon unloading in Chicago. There was less than one degree differential between top and bottom oranges and no appreciable variation from one end of the car to the other. (3) In March, the test car was started from Modesto, Calif., for Chicago with 42,300-lbs. of frozen lima beans. Side wall racks had been installed and the beans had been in storage at minus 17-degrees F., although warmed slightly during loading. Final temperature reading before unloading at destination was minus 23.2-degrees F.

Another test showed that the diesel engine's fuel consumption, even in hot weather, did not exceed 1 1/2 gallons/hr. All these tests, and hundreds more, convince Santa Fe that it has a prototype car, diesel equipped, which may well be adopted by many of the more than 150,000 cars now using ice as a refrigerant.



General view of the Diesel Engine Sales Co., Inc. taken from the top of the pilot house of the *Miss Four Hundred*.

"MISS FOUR HUNDRED"

By ED DENNIS

A milestone in the history of the Florida shrimping industry was passed when the 400th vessel to be launched by Diesel Engine Sales Inc. slid down the ways into the waters of the San Sebastian River at St. Augustine. A neat 67 footer, the *Miss Four Hundred* is a Tams designed shrimp

trawler built for Frank Fant of Jacksonville. The vessel was christened by Marilyn Melton.

Like the other 399 vessels built by St. Augustine's major shipbuilding concern, she is the latest word in craftsmanship. Following the launching, Mr. L.

C. Ringhaver, president and general manager of Diesel Engine Sales Co., was host at a typical southern barbeque on the shores of the San Sebastian River. Several hundred persons enjoyed the celebration in conjunction with the launching of the dieselized craft.

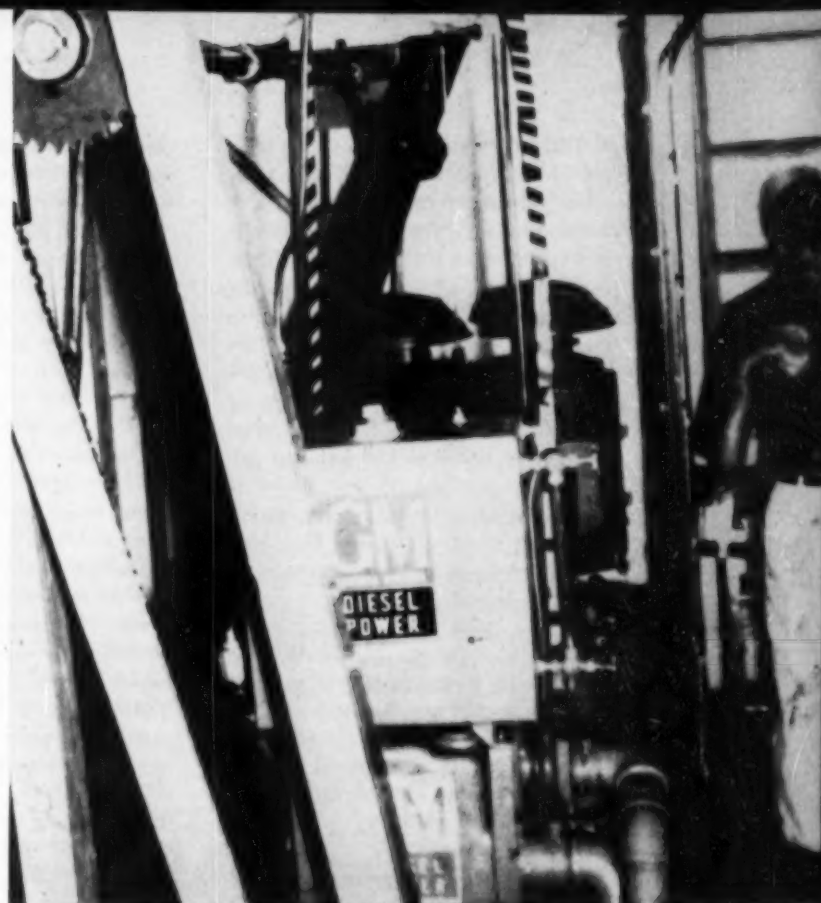


The *Miss Four Hundred* is powered by a GM Detroit Division Model 6-110, 2-cycle, 6-cylinder engine with a total displacement of 660 cubic inches. Overall, it is 48 in. x 35 in. x 80 in. At 600 rpm, it has a continuous shaft horsepower rating of 205, and will develop an intermittent maximum of 265 shaft horsepower. Its approximate dry weight, equipped with reverse and reduction gear is 4,300 pounds. It offers optional right- or left-hand rotation and front power take-off. The vessel is equipped with an Allison hydraulic clutch and 4.5:1 reduction gears. A Hallett diesel generating set supplies all the necessary power required for the ship's refrigerator, lights and other electrical equipment. The engine room is of the latest design. Fuel tanks have a capacity of 5000 gallons and with a 50x40 Columbian 4-blade propeller, her speed on the trial runs was better than 11 knots.

As he watched the *Miss Four Hundred* go down the ways, Frank Fant, the owner, remarked, "Two of the things that have made the shrimp business are big shrimp beds and diesel engines. Until we found the beds off Key West and Campeche, it was a kind of hit-or-miss business. Maybe you found a shrimp bed and maybe you didn't. You never knew. But once we found the big beds, we were in. Now with bigger boats using diesel engines, we can go out for three or four weeks and get a good catch. With diesel you go twice as far on half the fuel so you've got room for a big haul."

The crowd at the launching had an opportunity to inspect what is probably the only commercial boat assembly line in existence. Ringhaver builds boats pretty much the way Detroit builds automobiles. They start out at one end of the shed as raw material and emerge at the river end as completed boats, at the rate of two every week.

The compact engine room of the *Miss Four Hundred*, showing the GM Detroit Diesel Model 6-110, 2-cycle, 6-cylinder engine.

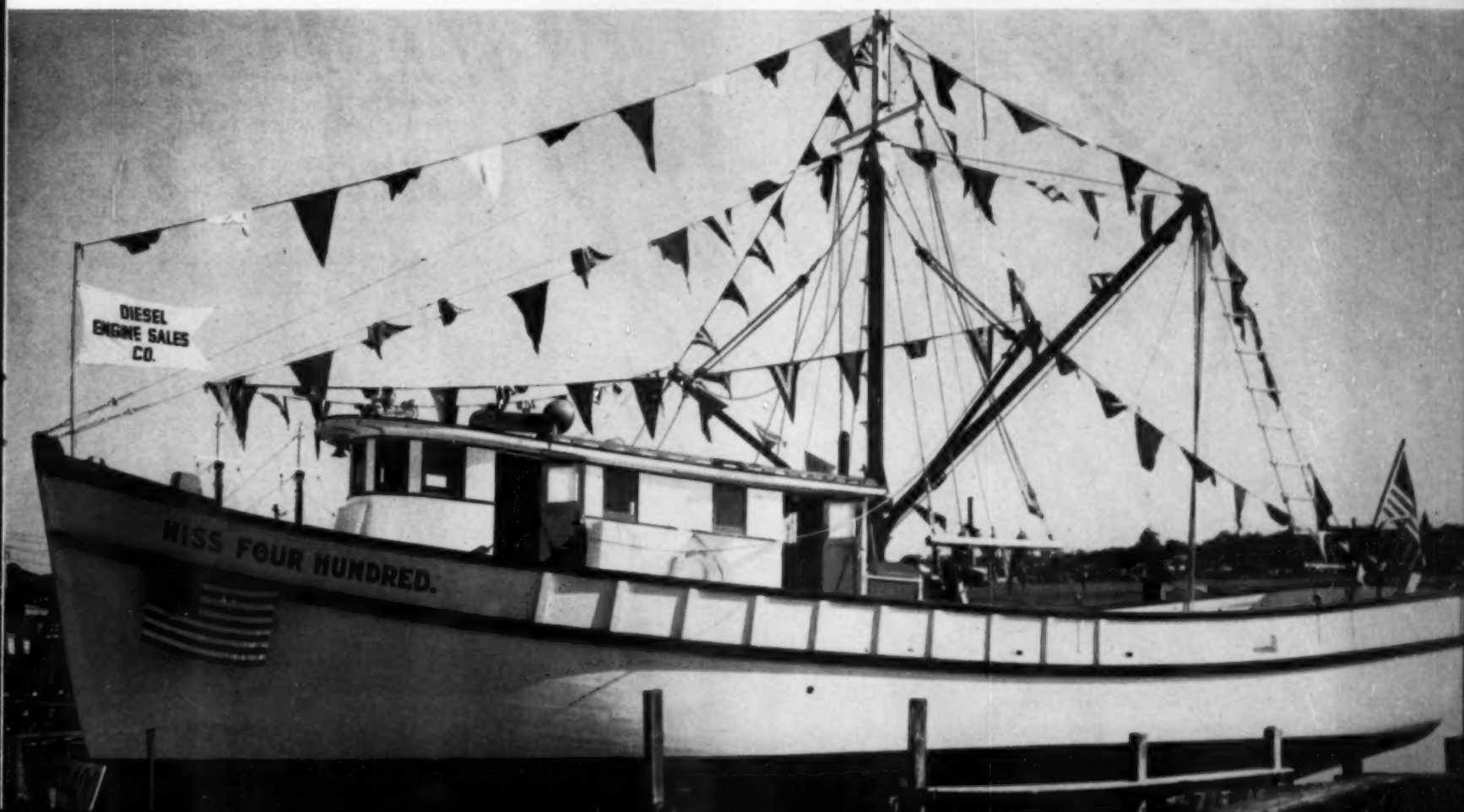


In operation since 1943, Diesel Engine Sales Co. has reason to be proud of the remarkable record it has to its credit. The first vessel launched was the *M. A. Bowlin* in October 1943. It took four and one half years to build the first one hundred vessels. The second hundred were completed in two years four months. The third hundred took slightly less than two years. *Miss Four Hundred* was launched one year and two months after the 300th vessel. Mr.

Ringhaver wouldn't say how long it will take him to build the next hundred but in that crowd of 500 you couldn't find anybody who would bet that he can't do it in less than a year.

When *Miss Four Hundred* hit the water, she was ready to start shrimping since she was a "package unit" complete with everything needed to start fishing.

Side view of the Tams designed shrimper powered by a GM Detroit Model 110 diesel.



"ON THE Au Sable River," has long been one of Grayling, Michigan's chief claims to importance. This river is known the world over as an excellent trout stream and yearly thousands of sportsmen come to the City to test their skill. Today, however, Grayling has another drawing card in the form of a new 1200 hp. Nordberg Supairthermal diesel engine generator unit. This unit, one of the first to be installed for municipal power generation in Michigan, is daily producing energy at a cost of 5.9 mills per kwh. and maintaining a production record of 14.5 kwh. per gallon of fuel oil. The excellent efficiency record of this engine has already attracted power officials from various parts of Michigan and City Mgr. Russell A. Carlson has the welcome mat out at all times.

Interesting, of course, is the fact that the Au Sable runs behind the city power plant and provides the cooling water for the new Supairthermal engine. Thus the river, in addition to drawing resortists to Grayling, is also instrumental in plant efficiency and permits the city to turn tourist power demand into plant profits.

Grayling started its municipal power program in 1940 following many years of buying power from a nearby utility. The city set up its lines adjacent to the utilities and at the same time built an attractive brown brick power house. Three four-cycle Buckeye engines pioneered the plant, one rated at 225 hp., 150 kw., and two rated at 375 hp., 250 kw. These units kept pace with a steadily growing

demand until 1947, when another Buckeye engine was added. This was a 600 hp., four-cycle, super-charged engine with 400 kw. capacity.

When the plant began operation it was turning out approximately 1,000,000 kwh. annually. Production had jumped to 2,392,000 kwh. when the 600 hp. engine was added and continued its climb so that in 1951 close to 3,000,000 kwh. were required. Peak loads in 1951 were averaging about 760 kw. and this was above firm capacity by 110 kw. Forced shutdown of any of the three larger units during the heavy demand period caused a failure in one section of the city. Grayling officials, faced with this problem, immediately considered the advisability of adding additional generating capacity or buying utility power to meet peak demands. All factors indicated that acquisition of another prime mover would be more economically sound and the Nordberg engine was purchased. The wisdom of this choice is reflected in the excellent economy record established by this unit in its first few months of operation.

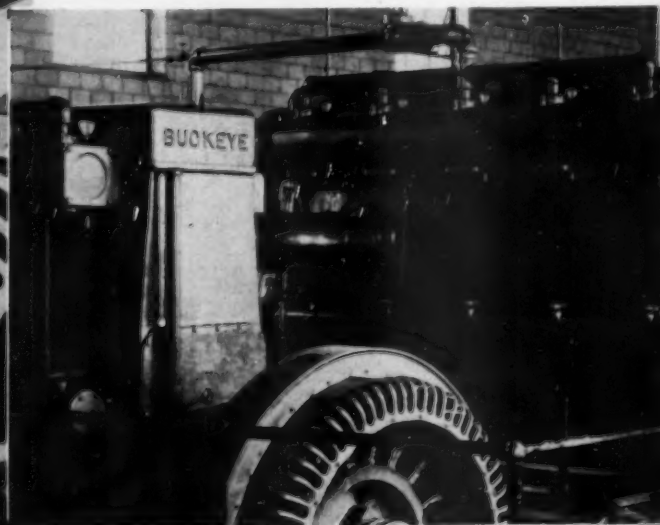
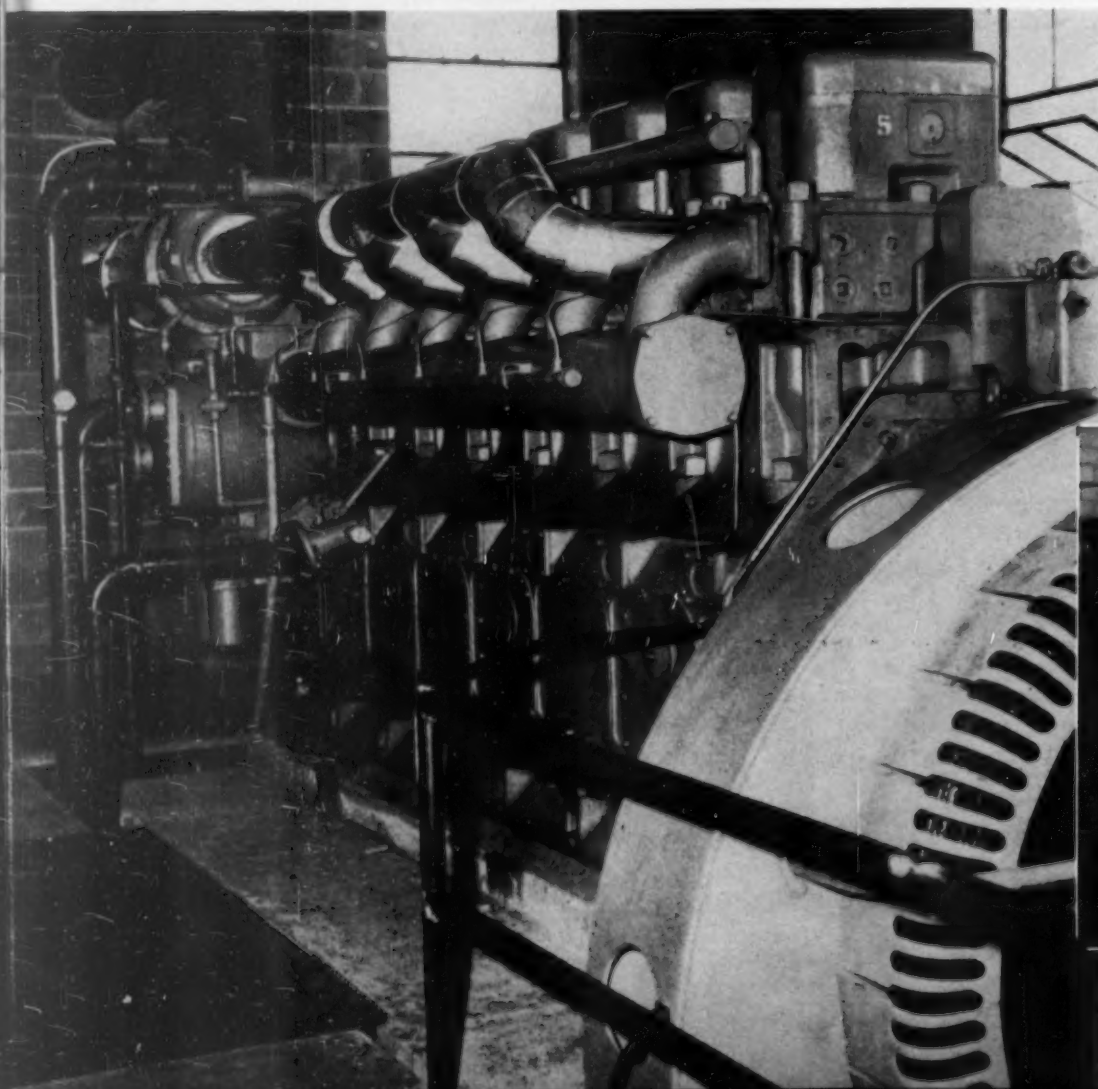
The Nordberg engine, of the four-cycle Supairthermal type, is rated at 1200 hp., 450 rpm. at 160 pounds bmep. and drives an 800 kw. General Electric generator. The engine has six cylinders of 13 in. bore and 16½ in. stroke and is equipped with a Ross intercooler and Elliott high pressure turbocharger. The Supairthermal engine went on the line April 20th, 1953 and has been handling the 8 a.m. to midnight load single handed since that date. Plant records for the month of May

GRAYLING, MICHIGAN

show that the new engine, operating at an average load factor of 54.6 per cent*, generated 215,000 kwh. out of the plant total of 307,000 kwh. In doing so, the Nordberg consumed 14,750 gallons of fuel oil, giving it an overall production average of 14.576 kwh. per gal. Records for 1952 show that the plant's other oil-burning diesel engines generated 3,393,700 kwh. over a 12 month period, burning 288,550 gals. of fuel for an average of 11.8 kwh. per gal. On the basis of \$.0875 per gallon of fuel currently paid by Grayling, the Nordberg engine is generating energy at a cost of 5.9 mills per kwh. compared to the other engines' record of 7.43 mills per kwh.

Rates at Grayling are among the lowest in the state and are directly competitive. The plant now serves

Exhaust side view of the new 1200 hp. Supairthermal engine showing the 800 kw. General Electric generator and Elliott turbocharger.





The Grayling plant is as modern as it is efficient. The attractive brick building was extended (shown right) to accommodate the 1200 hp. Supairthermal engine. Chief engineer Jess Sales is in the doorway.

By R. L. GREGORY

750 accounts and the competing utility, which handled all power requirements prior to plant inception, has approximately 60. In June of this year, Grayling reduced its residential and commercial rates to the following:

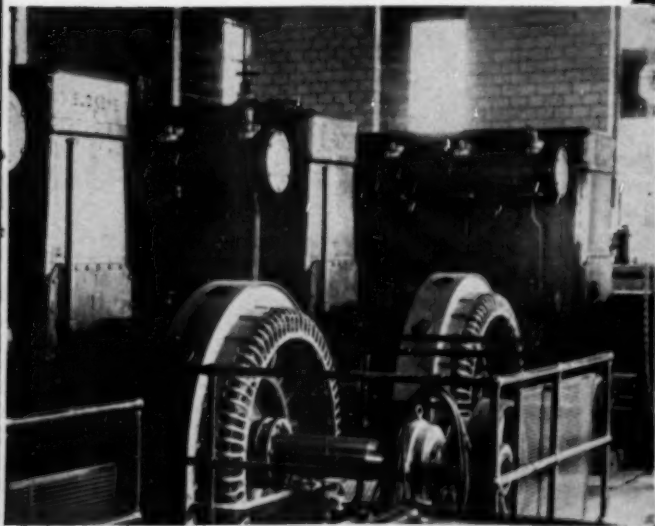
Residential:

- 5c per kwh. for first 50 kwh.
- 3c per kwh. for next 100 kwh.
- 2½c per kwh. for all additional.

Commercial:

- 5c per kwh. for first 50 kwh.
- 4c per kwh. for next 80 kwh.
- 3½c per kwh. for all additional.

Main bay of the Grayling plant. The four Buckeye engines have a total capacity of 1050 kw. The new 800 kw. Nordberg is installed in the cement block addition in the background.



A high quality No. 4 fuel oil is used in all the engines at Grayling. It is purchased from the Osceola Refinery Company, in Reed City, Michigan and is delivered by truck. Oil is stored in three above-ground tanks, two with a 10,000 gallon capacity and another of 20,000 gals. Lubricating oil used is Texaco Ursa. According to Jess Sales, Chief Engineer of the Grayling plant, lube oil consumption on the new Nordberg engine is particularly good as the record of 5220 rated bhp.-hrs. per gal. indicates. If figured on a production basis, the Supairthermal engine, in producing 215,000 kwh. during May, used 104.5 gals. or 2057.41 kwh. per gal.

Two distinct cooling systems are used for the prime movers in the plant and the Au Sable river serves each. The original three Buckeye engines utilize a unique heat exchanger which is located in the river adjacent to the power house. This exchanger is made up of two 60 ft. long sections of 6 in. pipe.

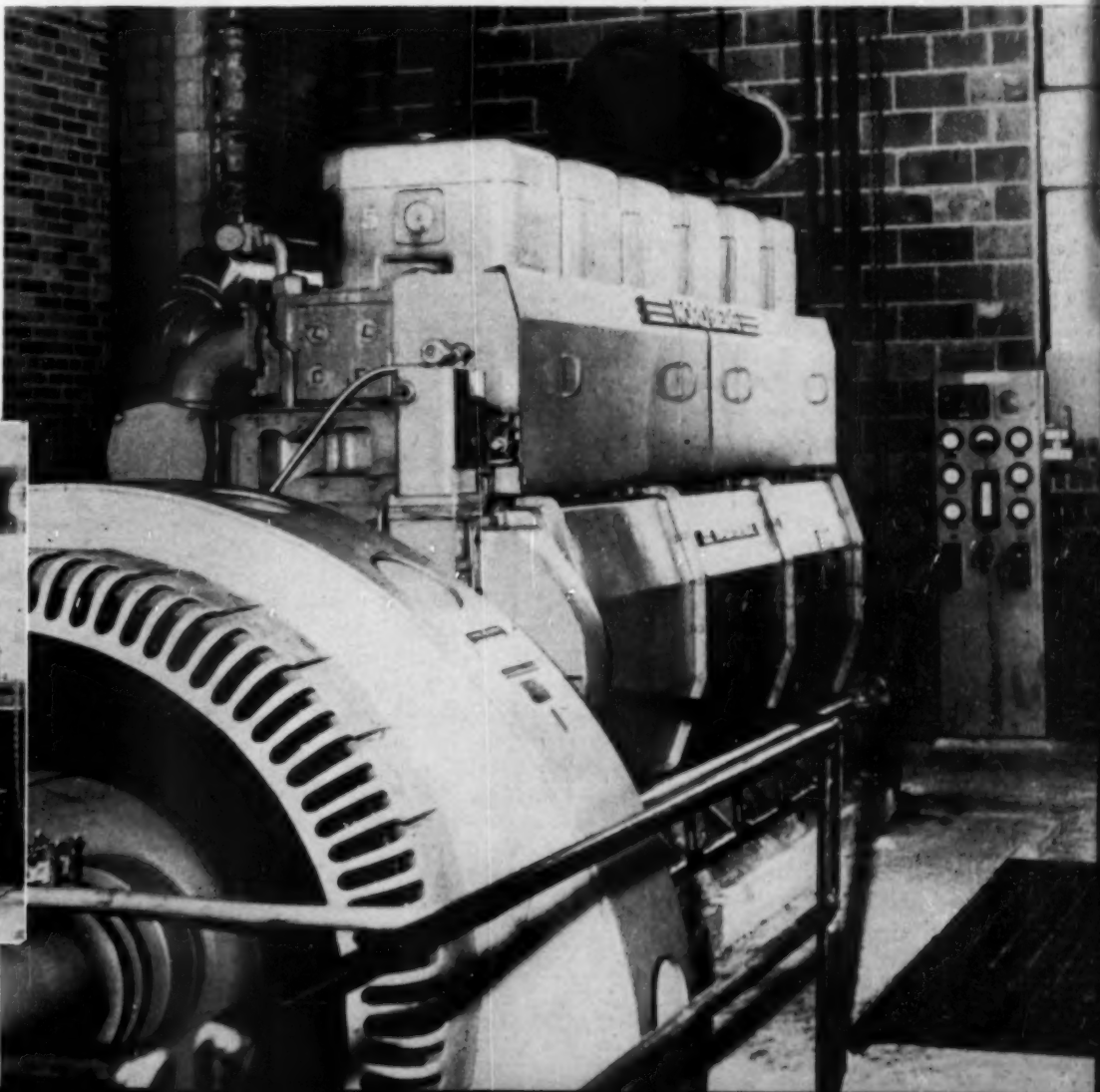
Jacket water is supplied through the city main and is pumped on a recirculative basis within this closed system. Systems for the No. 4 supercharged Buckeye engine and the 1200 hp. Supairthermal unit are identical and are especially well suited to efficient cooling. Two 500 gpm. pumps, located in a small concrete house along side the Au Sable, draw the river water through a common 14 in. intake pipe and deliver it through 4 in. pipe to the individual engines. A relief valve is employed in both lines to by-pass excess water. On the Nord-

berg engine, the water is pumped directly through a two-pass intercooler, the lube oil cooler, the jacket water heat exchanger and is then passed through a 4 in. pipe to discharge. Use of the river water is possible for cooling as well as a coolant since the Au Sable never freezes over. Water temperature during the summer averages 62° F. and during the winter about 39° F.

Officials of Grayling look to their modern power plant as a definite contribution to the welfare of the city and the low electric and power rates justify their pride. The plant serves an area within a two and one-half mile radius on three sides and extends its lines 4½ miles to the west to serve the principal resort area on Lake Margrethe. Actual population of Grayling is 2,066, however this number is practically doubled from July through November by resortists and sportsmen. Municipal operations are handled efficiently both at the plant which Chief Engineer Sales has operated from its beginning in 1940 and at the City Hall where City Manager Carlson recently took charge. All matters of City policy are decided in consultation with Mayor A. L. Roberts and Councilmen W. Simpson, D. Gothro, E. Giegling and E. Tahvonen. Mr. C. E. Moore handles the legal points as City Attorney.

**May is annually the lowest production month. Load starts building with tourist influx in July and reaches peak load in November. Anticipated peak load for 1953 is 840 kw.*

Newest and largest engine in the Grayling plant, a 1200 hp. 800 kw. Nordberg four-cycle Supairthermal diesel engine with Bendix Scintilla fuel pump.



HYDRAULIC COMPACTION FEATURES DIESELS

by James Joseph



D-8 and carryall dumps load at sluice box. Photo taken before installation of radio controls. Operator can be seen operating sluice box water jets.

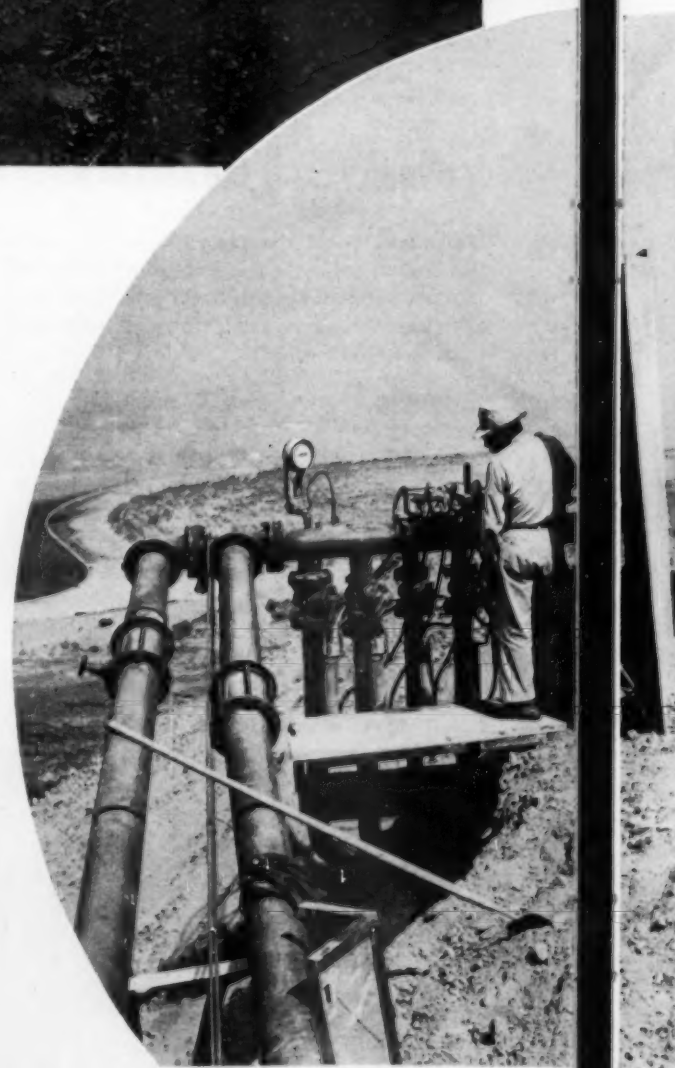
THE operator of a Caterpillar D-8, lugging a Caterpillar No. 90 carryall scraper, rumbles over the steep cut. As he nears a sluice box, he presses a button. The button triggers a small radio transmitter, signaling controls at the sluice box. As the loaded diesel unit nears the box, water gushes under pressure from thirty nozzles. The scraper dumps its load through a heavy grating. The dirt, blasted by the water jets, turns to muck. A moment later the box's gate automatically opens and the muck flushes into the fill, a hundred feet below. There it compacts to 95%—without tamping, without being scraped or rolled. It's a big earthmoving project—some 6,500,000 cu. yds. in all, and it's as nearly automatic as a cut-and-fill can be.

The scene? Whittier, Calif.'s Rose Hills Memorial Park. The project: one of the most unusual hydraulic compaction applications ever to team with dieselization. But let's move in for a closer, more detailed look. That D-8, for example, isn't a standard unit, not by any means. Its tracks are longer—one roller longer. Instead of a conventional straight-aligned engine, it's got a D-17000 V-8 engine. And the engine's horsepower is boosted to a whopping 235 h.p., thanks to a "High-Output" kit and other modifications. The carryall has likewise been modified, its sides built-up to tote 30 cu. bank yds., nearly 42 cu. "loose" yds. The dozer and its carryall weigh 90 tons, and cost Rose Hills something like \$70,000. Yet it will pay for itself just moving those 6,500,000 yds. But before the economics of the job, before the cost-cutting, there are some other obvious modifications—and they concern the carryall. Consider the tires. Front tires are 2400 x 29, 36-ply; rear tires, 2700 x 33, 36-ply. They're big—but so is the job.

Rose Hill's president, John D. Gregg, figures to recoup his \$70,000 investment in the time it takes to move those 6,500,000 cu. yds. How? Well, the new rig (one of six the cemetery operates) does the work of two D-8s, and gets the job done with less operators. Cut-filling 500,000 cubic yards on an earlier project ran 18-cents a yd. Sluicing the muck, then hydraulic-compacting it cut the cost to under 15-cents a yd. Now, with the new diesel tractor, Rose Hills expects to slice dirt moving to 12½-cents a yd. And for every penny-a-yard cut from the 6,500,000 cu. yd. project, there's a \$65,000 savings. Thus, the new rig will pay for itself. But the rig is only part of the story. The other part concerns hydraulic compaction and remote control of the sluice box.

The problem: much of Rose Hills' 2500 rolling acres are upthrust with hills, grades running to 65 per cent, and dogged with deep ravines. One of the rules of cemetery management is that grades be no greater than 25%. The cost of so much land-leveling seemed prohibitive. The saving feature of the thing was the soil: a hard-packed, sandy clay loam. Rose Hills' engineers tested the loam and became convinced that if moistened, it would be self-compacting. Luckily, too, after removal of a few feet of adobe top soil, the loam's consistency doesn't vary for 120-feet straight down.

The first major earth-moving project was launched at Rose Hills in 1947, with the shifting of 430,000 cu. yds., following standard cut-fill methods. The average distance of borrow was 500 to 750 feet. Cuts ran a maximum 60-ft, fills about the same. Average cut-fill: 35 feet. During this initial project, five D-8s pulled carryalls; a D-8 pusher helped



load the carryalls, and a D-8 rooter and a smaller tractor operated tampers. A round trip from cut to fill required six to eight minutes.

But the second grading job, begun in 1949, was a different and tougher story. It involved moving

dirt a horizontal distance of from 300 to 800-ft, and a vertical distance downhill from 100 to 200-ft. The haul was too long and round-about for economical carryall operation. It appeared that the only method would be to combine short and long-haul equipment. Then Rose Hills' John D. Gregg noticed that the loam dissolved readily in water—that it could be mixed in a sluice box and washed down-hill. Thus was born a unique earth-moving method—and a highly successful one.

Several years' modification led to real efficiency. First off, there's the steel (welded) sluice box 3 x 10 x 7-ft high, capacity about 8 cu. yds. The box, portable, is located atop the hill, overhanging the fill area. Its six banks of five, horizontally placed $\frac{1}{2}$ -inch dia. (opening), high pressure nozzles are arranged between overlapping steel bottom plates. Four 3-inch lines and two 4-inch lines feed the nozzles. Over the box's top is a heavy grating—the dumping port. The box's exit is rigged with an hydraulic sluice gate and a 48-inch steel pipe through which the muck gravitates into the fill. Up until a month ago the sluice box and

per cent. As a matter of fact, compaction in some areas runs 100%, even more. Today, the set-up has been even more streamlined, thanks to the added capacity of the modified D-8 and its carryall.

Each tractor is radio transmitter equipped, the signal becoming effective about 150-feet from the sluice box. The operator presses a button and transmits a signal. The signal is picked up at the box actuating a pilot valve. The valve in turn opens a screw-type, flanged hydraulic gate valve, which is 10-inches dia. Slow-opening, slow-closing is a necessary feature, since the pressure behind the gate is 150 psi. As the gate valve opens, it automatically opens the throttle of a stationary Caterpillar D-337 diesel engine which is directly coupled to an 8-inch Fairbanks-Morse centrifugal pump. Normally, the D-337 idles at about 550 rpm, but under full throttle and load it operates at 1000-2000 rpm. Thus, in the time between the operator's radio signal and his arrival at the dump-grate, the gate valve has opened, the stationary pump engine has revved up, and some 2300 gpm of water at 150 psi. are coursing through the high-pressure nozzles in the sluice box.

It requires about 30 seconds for the carryall to dump its load, and meanwhile the loam is being violently mixed, is converted to muck, and flows into the fill as the sluice gate automatically opens. It's a one-man operation—and highly efficient. And it's a prime example of teamwork between diesels, both mobile and stationary, and modern earth-moving techniques. Before various fills are

begun, dozers build a dike to control the flow of muck and to limit the fill and compaction area. Water comes from a 5000-bbl gravity tank, which keeps a portable, skid-mounted 250 bbl. tank full at all times, by means of a modulator valve on the intake of the small tank. Whereas 6-8 minutes were necessary for a carryall to load and dump at the sluice box on previous fills, the automatic controls and the high power of the new, modified D-8, cuts haulage to about 3-4 minutes. The sluicing unit is moved from time to time so that the haul distance is seldom over 300-feet. What about water costs? "They're negligible," says Rose Hills' vice-president, Joseph L. Seppi. "We seldom run up more than a \$100 water bill a month, even in full operation."

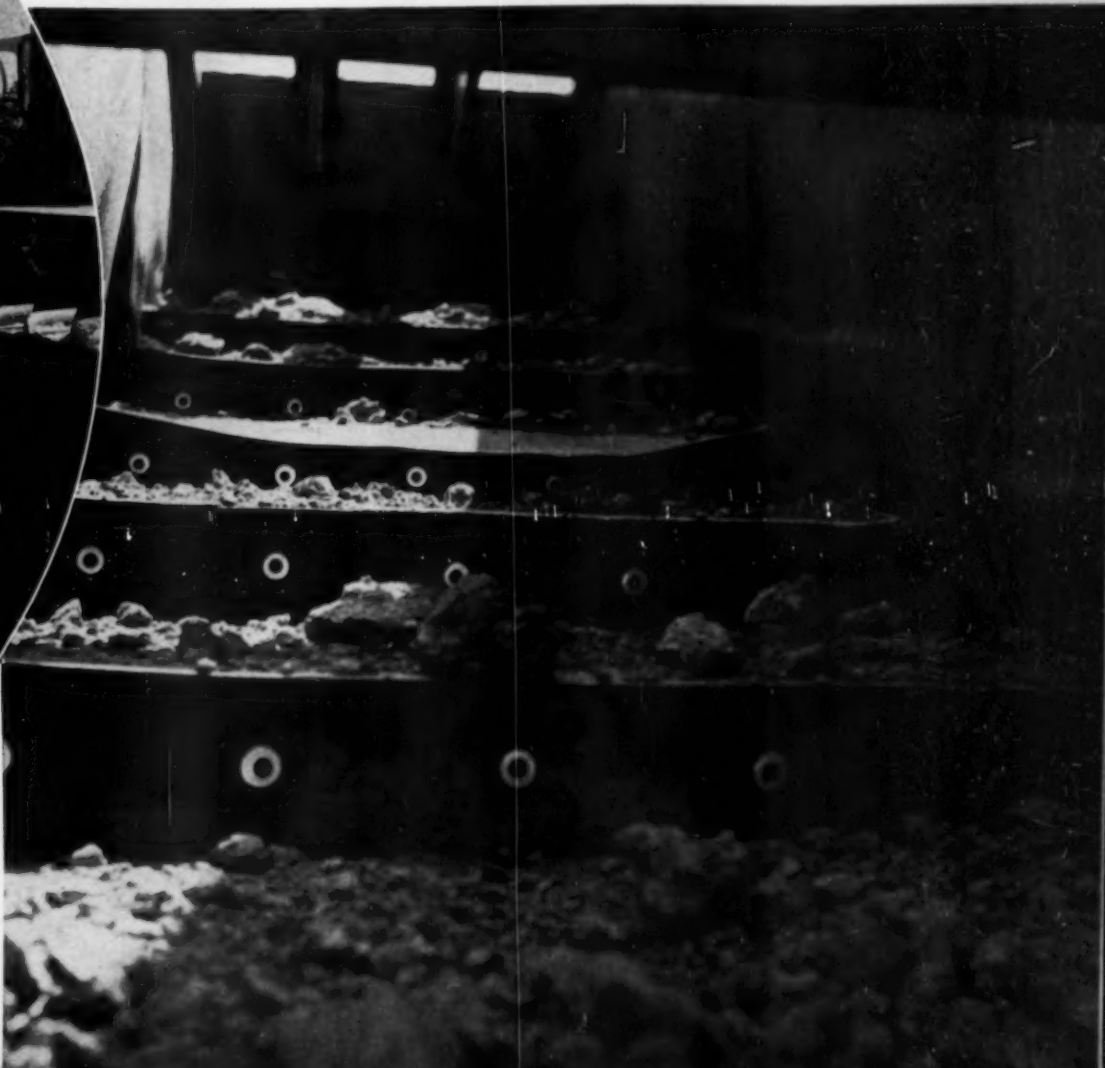
There was some question, originally, about how well the muck could be placed by sluicing. Results have been highly satisfactory. If the mixture is made sufficiently wet, muck flows the entire distance to the dam—or dike—about 800-feet on a 10 per cent grade. On the other hand, a dry mixture can build muck up around the sluice box on a grade of 20-25 per cent. The dike, dozer built to a height of 4-6 feet, is patrolled by a dozer as the fill rises. Dozers push surplus dirt into the wet fill and a new dike is built farther up the hill. By building the dike at the proper location, the slope can be adjusted to any desired grade. That's how sluice boxes, remote controlled diesel pumps, and dieseled earth-movers teamed at Rose Hills Memorial Park—a memorable advancement in cut-fill technique.

The carryall drops its load over grate leading to sluice box. After installation of radio controls, it became a one-man operation.

View of the interior of the sluice box. Note the six rows of five each high-pressure water nozzles.



its 30 nozzles were manually manipulated by an operator. He was a kind of "mixer," working various banks of nozzles to get just the right muck consistency—usually 20 per cent water, 80 per cent loam. This was considered the ideal compaction combination, and it self-compacts in excess of 95



An Oshkosh cane-hauler being unloaded at the Waipahu mill. The traveling electric crane picks up the lip of the trailer and raises it up causing the chain loop, nestled against the sides and bottom of the trailer, to straighten out and dump the entire load of cane into the bins at one time. In the background another Oshkosh cane-hauler is waiting to be unloaded.

Five Oshkosh cane-haulers in the Oahu Sugar Co. equipment parking area. These are equipped with Cummins 300 hp. Model NHRES-600 diesels.

SUGAR INDUSTRY IN HAWAII GOES 100% DIESEL

By BRUCE WADMAN

ALL of us at some period in our lives have experienced the enjoyment of satisfying the craving of our sweet tooth. Sugar plays a major role in almost everyone's diet, yet seldom do we think of how this vital food is grown and processed for our consumption. Recently in Hawaii, the opportunity came my way to look around the Oahu Sugar Co., Ltd.'s plantation on the island of Oahu and see one of the steps in the business of getting sugar to the consumer. The sugar cane fields were being harvested at the time, and it was a spectacular sight to see the completely mechanized manner in which the cane is harvested and delivered to the mills. Diesel equipment is used exclusively in the entire operation from cutting the cane to hauling and dumping it into the bins that convey the cane into the mill that converts it into raw sugar.

The Oahu Sugar Co. is the second largest plantation in the Territory of Hawaii. This sugar company, formed in 1897, owns cane lands that comprise nearly forty percent of the total acreage in cane on the island of Oahu and that cover almost 35 sq. miles. Fields range in elevation from 5 to 700 ft. and extend from the shores of famous Pearl Harbor to the mountains inland. The entire area under cultivation is dependent upon irrigation. The land

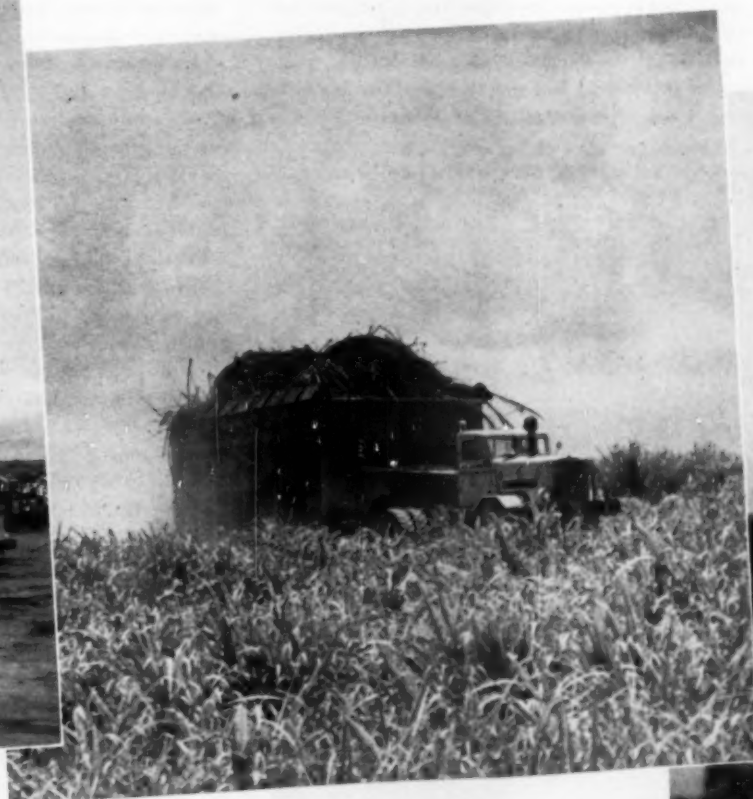
originally was an arid waste, and the Company's single greatest problem has been that of water. It has drilled artesian wells and pierced a mountain range with tunnels to develop an adequate and reliable water supply. The plantation has 12,000 acres under cultivation, of which approximately half or 6,000 acres is harvested each year. The same land has been under constant intensive cultivation for the last 54 years, and because of the scientific methods of fertilization and soil analysis employed by Oahu Sugar Co., the yield per acre has been more than doubled in this 54 year period. If the reader recalls the November, 1951 issue of DIESEL PROGRESS, he will remember that sugar cane in Hawaii is allowed to grow and mature for a period of 18 to 24 months. The fields of Oahu Sugar Co. are replanted only after every fourth crop or 8 years. The town of Waipahu, situated in the middle of cane fields, is the location of Oahu Sugar Co.'s mill, which is the largest single mill in the Hawaiian Territory. It turns out an average of 500 tons of raw sugar in a day. In 1952, a record crop of 81,572 tons of raw sugar from 6,501 acres was taken. A gross tonnage of 832,731 tons of cane was delivered to the mill; this shows the large amount of wastage occasioned by the conversion of cane into raw sugar. Roughly fifty percent of the annual

production of the plantation is refined at the Aiea C&H refinery on Oahu for local consumption, and the rest is shipped as raw sugar to the C&H refinery at Crockett, California.

In 1948 Oahu Sugar Co. started switching from rail hauling of cane from fields to the mill with steam locomotives to diesel truck hauling. Half the plantation was converted in 1948, and the process of changeover to truck hauling for the whole plantation area was completed in 1950. This is one of the latest plantation conversions to diesel truck cane-haulers—a trend that has been sweeping over most of the island plantations. Truck hauling operations have been going on in a number of other plantations in Hawaii ever since World War II; some even date back to the late 1930's. The plantation has built and maintains 178 miles of roads. Twelve Oshkosh Model W-2209M tractor trucks and semi-trailers are the newest equipment that Oahu Sugar Co. has put into operation to haul cane. These huge cane-haulers can carry a payload of 30 tons and are powered by Cummins 300 hp. Model NHRBS-600 supercharged diesels. Hans L'Orange, the manager of Oahu Sugar Co. plantation, who has been with the Company since 1911 and has been manager for the past 17 years, is sat-

An Oshkosh cane-hauler, powered by a Cummins 300 hp. diesel, highballing it down to the mill through the cane fields with a full load of sugar cane.

Mr. Hans L'Orange, manager of Oahu Sugar Co. plantation, with plantation fields in the background.





View of Oahu Sugar Co.'s equipment parking area with the Diamond T, Four-Wheel-Drive, and



A view of the harvesting operation in the cane fields with a Caterpillar D-7 diesel tractor piling the cane, and a Northwest Model 41 crane with a Caterpillar 113 hp. diesel, loading a two-ton bite of cane into an Oshkosh cane-hauler powered by a Cummins 300 hp. diesel.

ified with his new all diesel operation and strikes a praiseworthy note at the efficiency and trouble-free operation of his newest diesel equipment. "The equipment, engineered for the type of land and weather conditions encountered in the fields, has proved itself to be sound in design and very satisfactory in operation."

The use of diesel trucks in cane hauling is more economical and efficient than rail hauling for a number of reasons: 1.) the diesel equipment is much more flexible—flexibility was the main reason

for the changeover. If it rains in one part of the plantation, the trucks can be moved to another dry section with a minimum of time lost, whereas with rail operations, the tracks had to be taken up and moved to another field—a process that necessitated much labor and time loss; 2.) the diesel cane-haulers bring the cane to the mill quicker and in a much fresher state. It is important to get cane to the mill quickly because the cane will turn sour easily if left in the fields too long; 3.) less manpower is required and the fuel and maintenance costs are much less than in rail operations.

From left to right: Bob Rex, automotive superintendent talking to N. Goto, service foreman, in one of the repair shops at Oahu Sugar Co.'s equipment maintenance yards.



The dieselizing of the entire harvesting system at Oahu Sugar Co. is now complete with the addition of the diesel cane-haulers. When a cane field is ripe, firebreaks are set up, and the field is set on fire in order to burn away the trash and leaves; the cane stalks themselves are not injured. It is quite a thrill to see a cane fire, which looks like a prairie fire and burns at the astonishing rate of one acre per minute. After the cane is burned, a tractor with a bulldozer cutter rake comes in and cuts the cane off at ground level and rakes it in long rows. Then a "Cat" motor grader makes roads through the field so that cranes can move in and load the cane-haulers. The diesel cranes (8 Northwest cranes powered with Hercules Model RX diesels in 4 and Caterpillar Model 8800 diesels in the other 4 are used in harvesting), equipped with big grab shovels, pick up the cane in two-ton bites and dump it matter-of-factly in waiting Oshkosh cane-haulers, which when loaded to the brim with more than 25 tons of cane, rumble down to the mill and dump their load into bins at the mill entrance. The average time elapsed from the time of the burning of the cane to its arrival at the mill is twelve hours.

Robert R. "Bob" Rex, Oahu Sugar's automotive superintendent of the more than 400 pieces of equipment in use on the plantation is proud of the performance records of his new Oshkosh cane-haulers. Here is some operational data on the first four Oshkosh trucks to be put into service. The figures are taken from March 3, 1952 to September 30, 1952.

Total Ton Miles for the period.....	721,048
Total Tons Cane hauled for the period.....	253,729
Total Operation hours for the period.....	10,078



Kenworth trucks shown. These trucks are powered with Cummins and Hercules diesels.



An Oshkosh cane-hauler on the road to the mill with a full load of sugar cane. The Waipahu mill can be seen in the background, with sugar cane fields nearby and in the distance. Winslow lube oil filter is shown on the side of the cab of the cane-hauler.

TABLE I

Dollar Cost of Operation

Ratios:	Fuel	Oil & Lube	Tires & Tubes	Repair & Maint.	Total
\$/oper. hr.	.430	.064	.433	.699	\$1.626
\$/ton cane	.017	.0026	.0171	.0277	.0644
\$/ton mile	.006	.0009	.0061	.0097	.0227

These figures in Table I do not include repair and maintenance costs for the annual over-hauling operation done on all equipment during the off-season. According to Bob Rex, however, the overhaul cost was very small and only included disassembly and inspection with no replacement of major parts.

Since World War II, a shortage of labor and steadily rising wage levels have made improved mechanical harvesting imperative if Hawaiian growers are to stay in business in competition with sugar growers elsewhere in the world who pay much lower wages. Diesel equipment has been one of the prime factors contributing to the success of this mechanization, which has, in turn, assured the continuance and progress of the Hawaiian sugar industry.

A list of the diesel equipment in use on the Oahu Sugar Co. plantation includes:

Tractors:

- 44 Caterpillars ranging from D-4 to D-8 models.
- 14 International Harvesters ranging from TD-9 to TD-24 models.
- 5 Caterpillar Model 12 motor graders.

Trucks:

- 6 Diamond T's with Model DF-XE Hercules 214 hp. diesels.
- 6 Diamond T's with Model HR-600 Cummins 165 hp. diesels.
- 4 Four Wheel Drives with Model HB-600 Cummins 150 hp. diesels.
- 4 Kenworths with Model HB-600 Cummins 150 hp. diesels.
- 12 Oshkosh with Model NHRBS-600 Cummins 300 hp. diesels.

Cranes:

- 5 Northwest with Model 8800 Caterpillar 113 hp. diesels.
- 4 Northwest with Model RXB Hercules 133 hp. diesels.
- 1 Northwest with Model 13,000 Caterpillar 151 hp. diesel.
- 1 P&H with a Model 6-71 GM diesel.
- 1 P&H with a Model 8800 Caterpillar diesel.
- 1 P&H with a Model 13,000 Caterpillar diesel.

A Northwest Model 41 crane, powered by a Caterpillar 113 hp. Model 8800 diesel, loading one of the Oshkosh cane-haulers with a two-ton bite of sugar cane. Standing from left to right in front of the cab: Harry Hoxie of Von-Hamm Young Co., Hawaiian distributor of Cummins diesels; driver of the cane-hauler; and Bob Rex, automotive superintendent of Oahu Sugar Co.

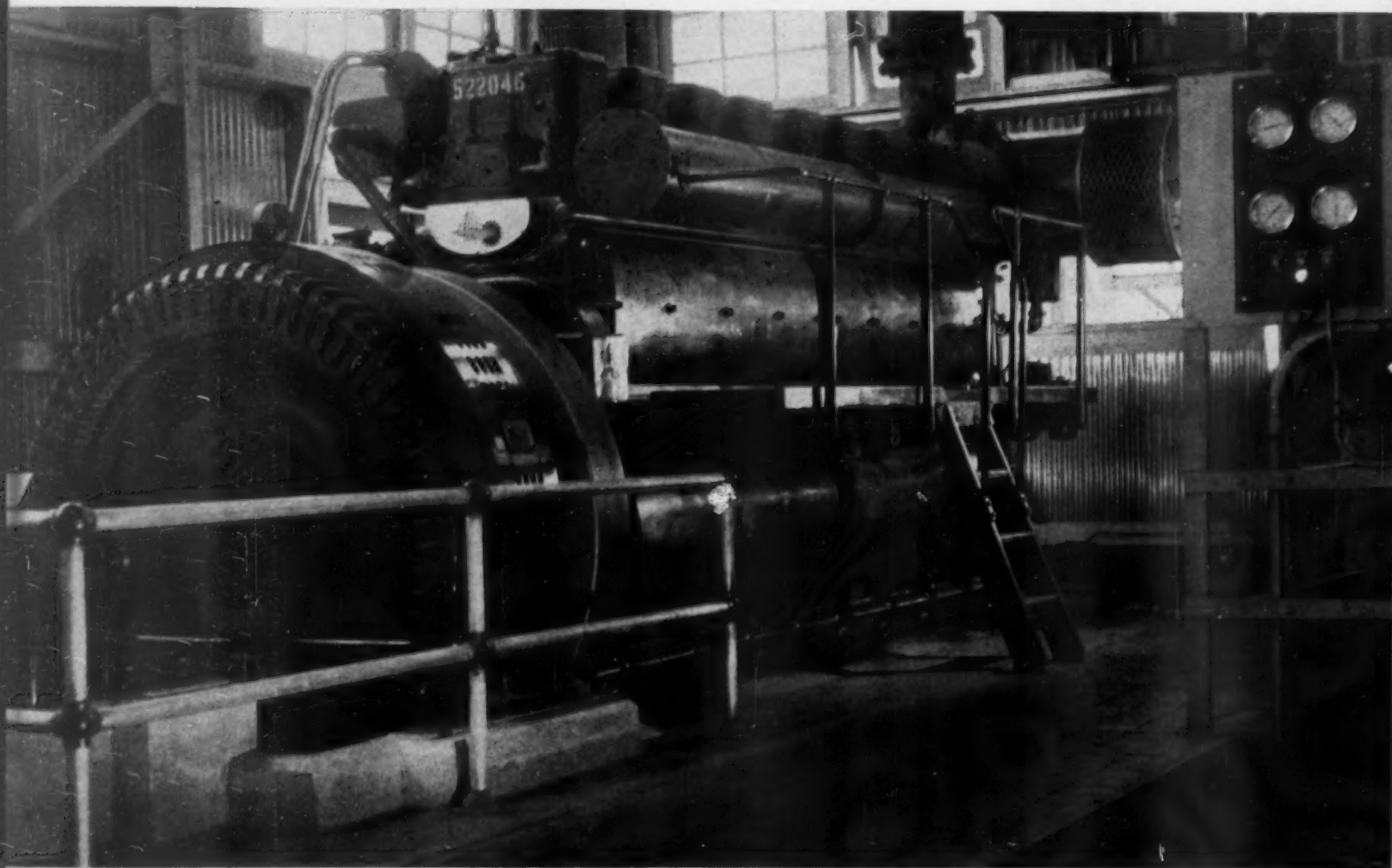


STRIP MINING IN DUTCH GUIANA

Diesels Make Possible Community Living and The Mining of Aluminum Ore by Providing All The Main Power Requirements

By PAUL M. KOCHENSBERGER*

**Sales Engineer, American Locomotive Company.*



One of the two Alco 12½ by 13, eight cylinder, 1080 hp. diesel engines installed in the power station at Moengo in 1952. Both engines are coupled to Westinghouse, 3 phase, 60 cycle, 760 kw. generators. Exhaust metallic hose is Chicago Metal Hose.

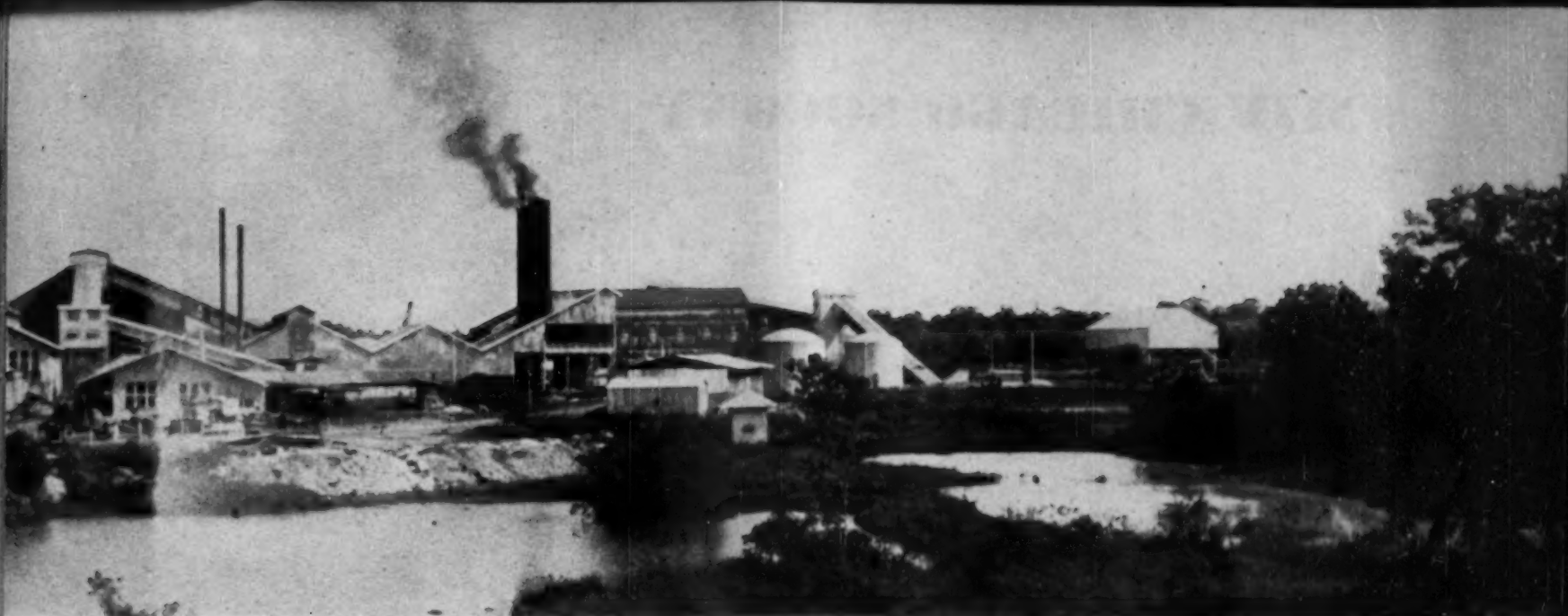
IN THE world-wide quest for raw ore to fill the ever-increasing demands for aluminum, Aluminum Company of America has established mining centers in countries overseas. One of these is located in Dutch Guiana, where their mining division is operating two large mines for the production of bauxite, the ore from which aluminum is smelted by a process of electrolytic reduction. These mines are at Paranam, approximately 25 miles up the Surinam River from Paramaribo, the capital city of Dutch Guiana, and at Moengo, deep in the tropical jungle 100 miles inland on the Cottica

River. Both the mining operations and the power needs of the entire communities of Paranam and Moengo are dependent on the electricity generated by diesel engines, as there is no other source of power in either of the two cities.

Ore was first mined in Moengo in 1924. At that time Alcoa bought three Worthington air injection diesel-electric generating units which were designed to supply all of the electric power needs of the mine, the processing plant and the surrounding community. Since then, four American Locomotive

Company diesel engines have been installed. In 1940, when expanding operations demanded an increase in power facilities, the company installed an Alco six cylinder, 12½ x 13 in. diesel engine. This was coupled to a Westinghouse a.c. generator of 376 kw. capacity.

Operations at Moengo further expanded, and in 1949 a 570 kw. Alco-powered unit was installed to handle the increasing demands for electric power. Two Alco eight cylinder, 12½ x 13 in. engines were added to the Moengo power station in 1952.



The Alcoa Mining Company's bauxite processing plant at Moengo. Ore is dumped from railway cars into the crusher at far right, then carried by belt conveyors to outdoor stockpiles or to rotary kilns, center, for drying and from there to storage shed at left.

each of which is capable of generating 760 kw. of electricity. The Paranam mines were established in 1940 when the outbreak of World War II emphasized the importance of aluminum as a vital defense material. Then four Alco six cylinder, 12½ x 13 in. diesel engine generating units, capable of producing 376 kw. each were installed to handle the power load, and in 1951 a 570 kw. Alco-powered unit was placed in service.

Moengo is typical of the two areas in that it was carved out of the virgin jungle for the exclusive purpose of mining bauxite. Its population of about 3200 is made up of Creoles or "Surinamers," Javanese, Chinese, Guiana Indians and Caucasians, all of whom live in complete harmony in their snug little city situated about 5 degrees north of the equator. Because the community is located in the remote bush country, with the Cottica River the

only link with the outside world, it has been necessary to build complete living facilities to serve the population. These include homes, a school system, recreation areas, and a large, fully-staffed-and-equipped modern hospital. Another civic development is the community water works built to pump water out of a number of deep wells. The water is filtered and chlorinated prior to being piped to the standpipe and reservoirs.

Bauxite is mined in Moengo by a stripping operation wherein the over-burden earth may be a few inches to several feet thick. After stripping, the raw ore is cut out by Bucyrus-Erie electric power shovels and loaded into 20-ton ore cars. Ore trains are made up of 18 such cars which are drawn over the narrow gauge railroad from the mines to the ore processing plant by Whitcomb diesel-electric locomotives. The first step in processing bauxite is

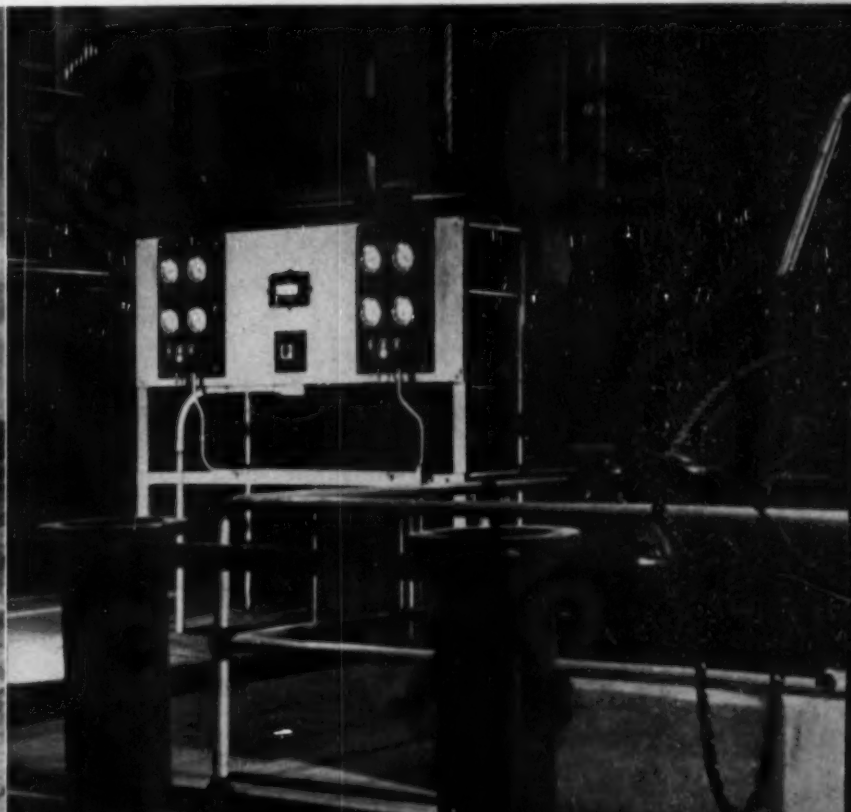
to crush it by means of a heavy Hammermill crusher. The crusher, like all the refining and much of the mining equipment, is driven by diesel-generated electricity; in this case a 500 bhp, 600 rpm. motor. The crushed ore leaves the crusher by gravity and travels by belt conveyor to a battery of oil-burning rotary kilns and is thoroughly dried, following which it is carried to a large storage shed.

From storage the bauxite is moved by conveyor directly into the holds of freighters designed to carry fuel oil into the community and ore out on the return trip. The oil is pumped ashore at the same time that bauxite is loaded aboard. The bauxite is then shipped to Gulf Coast ports in the United States for delivery to either the Mobile or East St. Louis refining plant, after which it is sent to its final destination, one of the smelting plants of the Aluminum Company of America.

A Bucyrus-Erie electric power shovel at the Rikanau Mine eight miles outside of Moengo. Shovels of this type load raw bauxite into 20-ton mine cars for transportation to the crushing and drying plant

The gauge board connected to the two new Alco diesels includes fuel oil, lube oil pressure and air starting pressure gauges, Alnor pyrometer, and also a Viking M-3-B alarm and horn. Boards are mounted on steel panels.

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M/V CHICAGO SOCONY

THE M/V *Chicago Socony*, twin screw diesel propelled tanker, has been completed by the Todd Shipyards Corporation for the Socony Vacuum Oil Company. Mrs. Bryan S. Reid was the gracious sponsor of the vessel in Houston. She is the wife of the general manager of the Chicago Division of Socony Vacuum. Sea trials were held after sponsoring and the ship then proceeded to Chicago via Galveston, the Gulf and the Mississippi and Illinois River, where arrangements have been made for the reception of the first tanker to bear the name of Chicago.

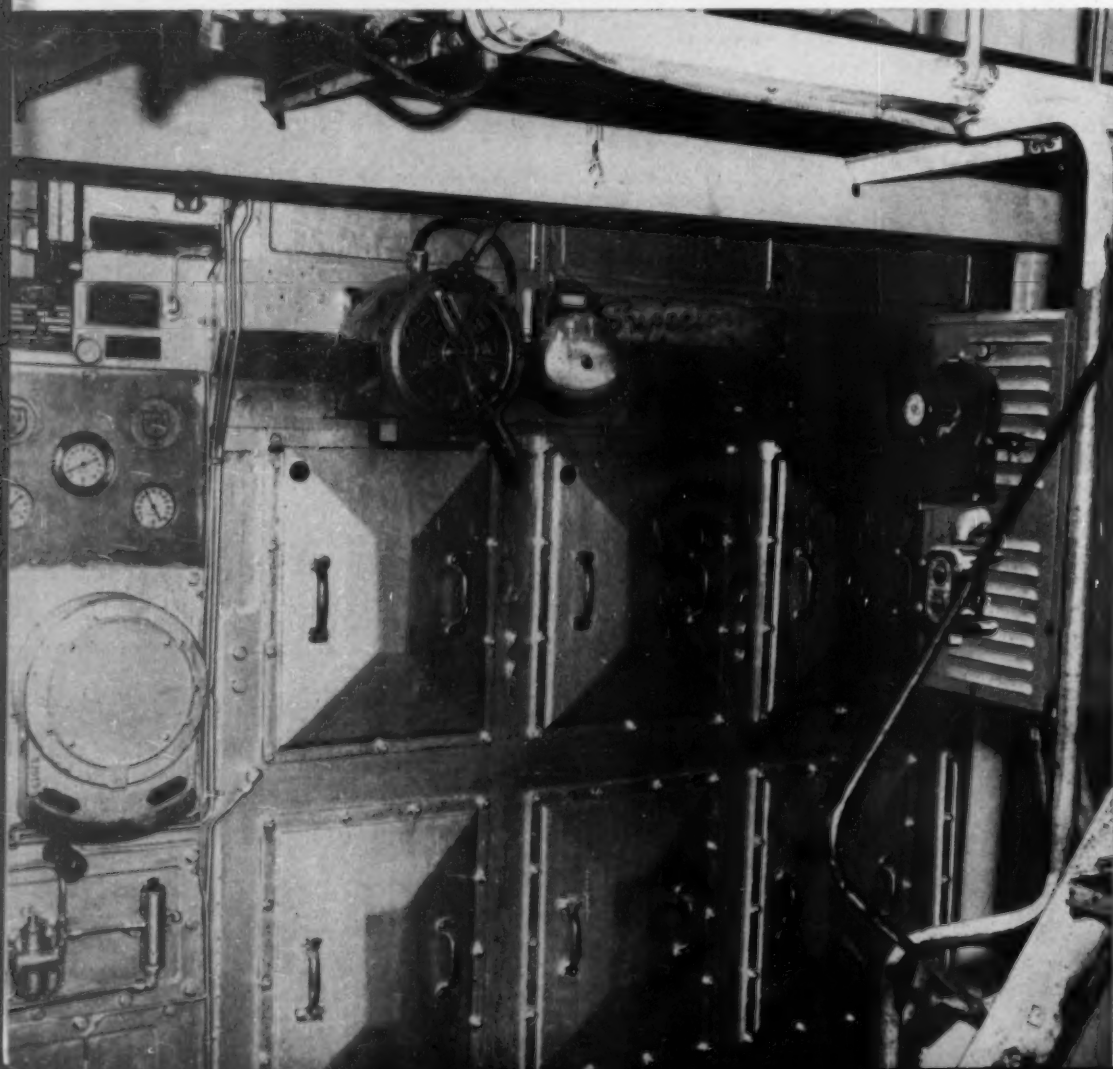
The design of the M/V *Chicago Socony* is quite unique as she has been built to serve not only on the inland waters of the Great Lakes but also able to transit the New York State Barge Canal for service on the Hudson River and the New York area, and also built to carry cargoes on limited coast-wise voyages to Philadelphia, the Jersey Coast, Long Island Sound, Boston Bay and the Coast of Maine. She has the largest capacity of any vessel yet designed to transit the Barge Canal. The limited clearances under the New York State Barge Canal and the Chicago Drainage Canal are such that the vessel is equipped with a retractable pilot

house, folding mast and collapsible stacks so that she can proceed in these close waters with minimum delay.

In designing the vessel to meet the above conditions consideration was given to the maximum speeds and pumping rates which would be practical to get maximum service from such a vessel. The Experimental Towing Tank of Stevens Institute was used to make model tests. These tests indicated that speeds in excess of 15 miles per hour or 13½ knots could be anticipated. The vessel is powered with engines developing in excess of 2,000 shaft hp.

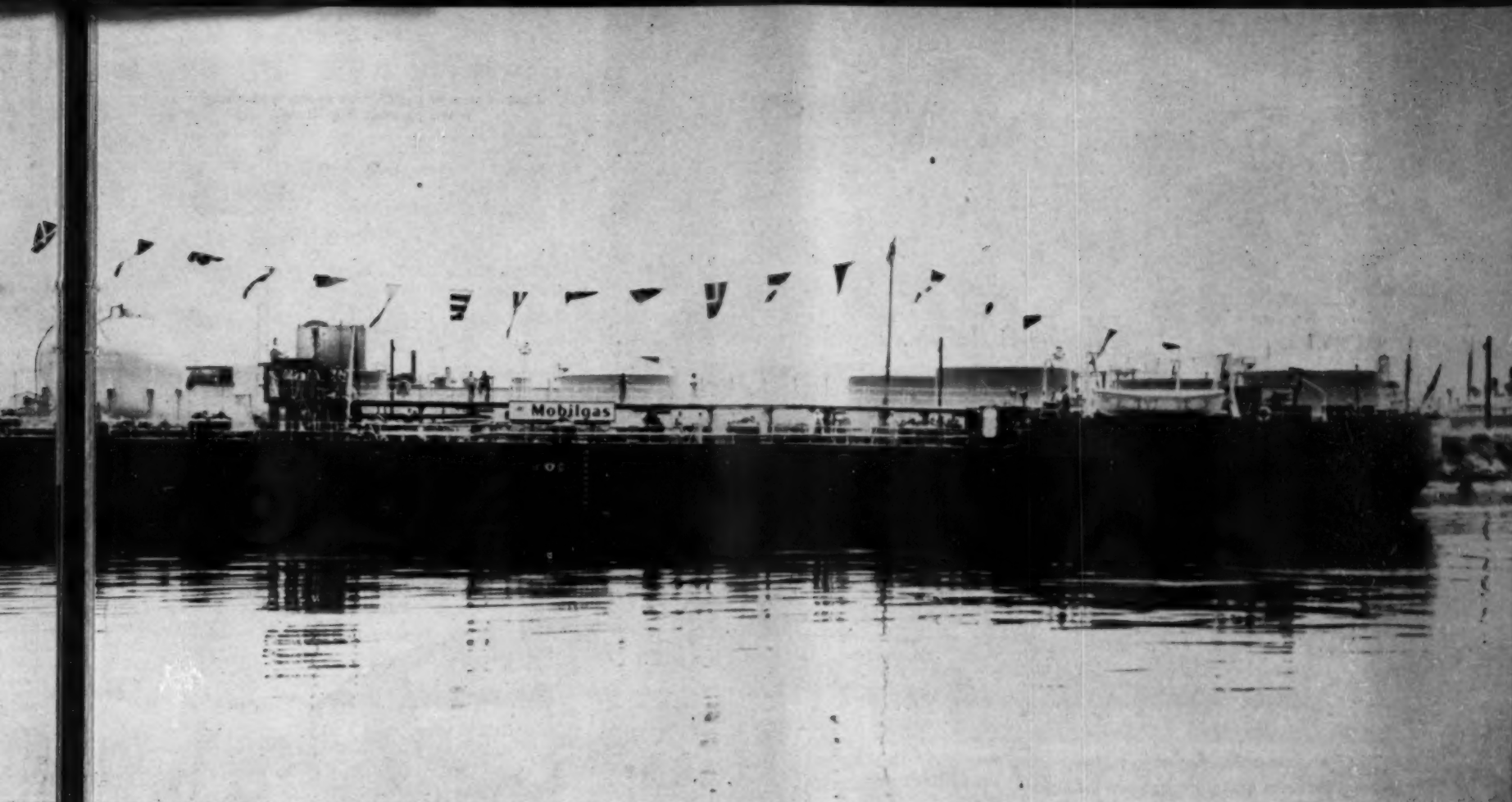
With the information in Table I, the design was undertaken by the Socony Vacuum technical staff to develop the maximum capacity that could be carried in a vessel to operate on the diversified routes, yet consideration was given to maximum comfort and engine room accessibility in such a vessel. Todd Shipyards were the successful bidders on the specifications and received the contract to build the *Chicago Socony*. The first interest centered about the engine room which had to be of the minimum length to provide for maximum cargo and then the greatest comfort which could be

Inboard view of one of the National Supply Superior diesels, 6-cylinder, direct reversing, 14½-in. bore by 20-in. stroke, rated 1080 bhp. at 360 rpm. Engines are of opposite rotation. The engines have Bendix-Scintilla fuel injection systems.



built in the crew's accommodations. In order for the vessel to pass under low bridges on the canals, it was necessary to reduce the normal height of the foc's'le and to limit the normal windlass. This resulted in the unusual situation of a half foc's'le, which is apparent from the general arrangement, yet it is possible as can be seen from the tests, to anticipate excellent performance in close waters at the high speeds which will be accomplished through the power in a vessel of this size. In rough waters there is no question that the vessel will be somewhat wet on deck but the ability to raise the pilot house hydraulically will still make it a very seaworthy vessel in any weather that may be encountered on the Great Lakes or limited coast-wise service for which the ship is designed.

Engine Room Layout—The bottom decks are longitudinally framed, the sides and bulkheads transversal framed. To conserve space the machinery room has been laid out as follows: the main engines are set on foundations of the minimum length and so situated as to allow sufficient room out-board for the location of fire pumps, ballast pumps, hydraulic pumps, air compressors, etc. Between the main engines and the C/L of the vessel are located two Briggs clarifiers and two emergency lubricating oil pumps. On the forward engine room bulkhead is located the engine room log desk with all the necessary instruments and main engine telegraph system. Just out-board of the log desk, and over the pump room, is located the CO2 compartments. At the aft end of the engine room is a raised generator plate sitting on top of the cooling water tank which supplies all the cooling water for the three generator sets. Outboard of the auxiliary generator sets on the port side are located the two refrigeration units. Other units are of sufficient size to handle both the deep freeze and chill box. On the star-



The Chicago Socony in the Houston Ship Canal against a background of the industries which she will serve.

board side is located the engineer's work bench, drill press, and electric grinder. Just aft, port and starboard, are located the two 20 hp. boilers and their respective condensate pumps. The hot well for the condensate return is seen in the generator flat next to the after peak bulkhead on the C/L.

Main propulsion engines—Manufactured by National Supply Co., Springfield, Ohio, and in keeping with other machinery items, was furnished by Smith-Meeker Engineering Co., New York. The propulsion engines are each Superior, Elliott Buchi supercharged, six cylinder in line, four stroke cycle, direct reversing marine diesel engines of 14½ in. bore by 20 in. stroke, each engine rated 1080 bhp. when turning at 360 rpm., and operating under maximum conditions with 120 lbs. bmep. Engines are of opposite rotation. The diesel propulsion engines are Kingsbury Bearing equipped, with oil cooled pistons, fuel strainer services, and with built-in rotary type fuel service and lube oil service pumps. Considerable development work was performed with regard to main engine circulating water piping, salt water cooling piping and fuel oil and lube oil flow systems, in order to guarantee that all accessory equipment for each engine would fully meet the owner's requirements in guaranteeing foolproof operation of these important services. Westinghouse Air Brake controls have been utilized for pilot house operation of the engines with duplicate instrumentation being made in both the pilot house and the engine room.

Among engine accessories used with the propulsion engine installation are Maxim Model WMU silencers, Ross lube oil coolers, Ross jacket water coolers, Weston electrically operated engine tach-

TABLE I

SPECIFICATIONS

General

Light Weight—Approximate.....	1,320 S.T.	1,180 L.T.
Deadweight—To Summer Load Line—Approximate.....	3,680 S.T.	3,280 L.T.
Displacement to Summer Load Line—Approximate.....	5,000 S.T.	4,460 L.T.
Length Overall.....	300 ft.	
Length between Perpendiculars.....	290 ft. 11¼ in.	
Breadth (Molded).....	45 ft. 3 in.	
Depth (Molded).....	19 ft. 3 in.	
Draft, Keel (to Summer Load Line).....	15 ft. 8½ in.	
Operating Speed Normal Power.....	15.5 mph.	13.5 knot
Draft Coastwise.....	15 ft. 8½ in. S.W.	
Coastwise Operation—Cape May to Eastport, Maine		
Classification—ABS A1E Grade B		
Overall vessel height (keel to truck) for Canal Operation.....	26 ft. 5 in.	

Capacities

Total Cargo Capacity.....	26,052 Bbls.	
Fuel Oil Bunkers P & S.....	109 S. Tons	97 L.T.
Ballast Peak Tanks.....	248 S. Tons	221 L.T.
Drinking Water Tank Capacity.....	12.5 S. Tons	11.2
Cooling Water.....	47 S. Tons	42

Machinery

Shaft Horsepower—Normal.....	2,160 bhp.
Shaft Horsepower—Maximum (In Emergency).....	2,480 bhp.
Fuel Consumption—Normal Power Maximum.....	10.9 S. Tons/Day
	9.7 L.T./D
Three main generators—115-230V.—DC.....	125 kw. each

Cargo System

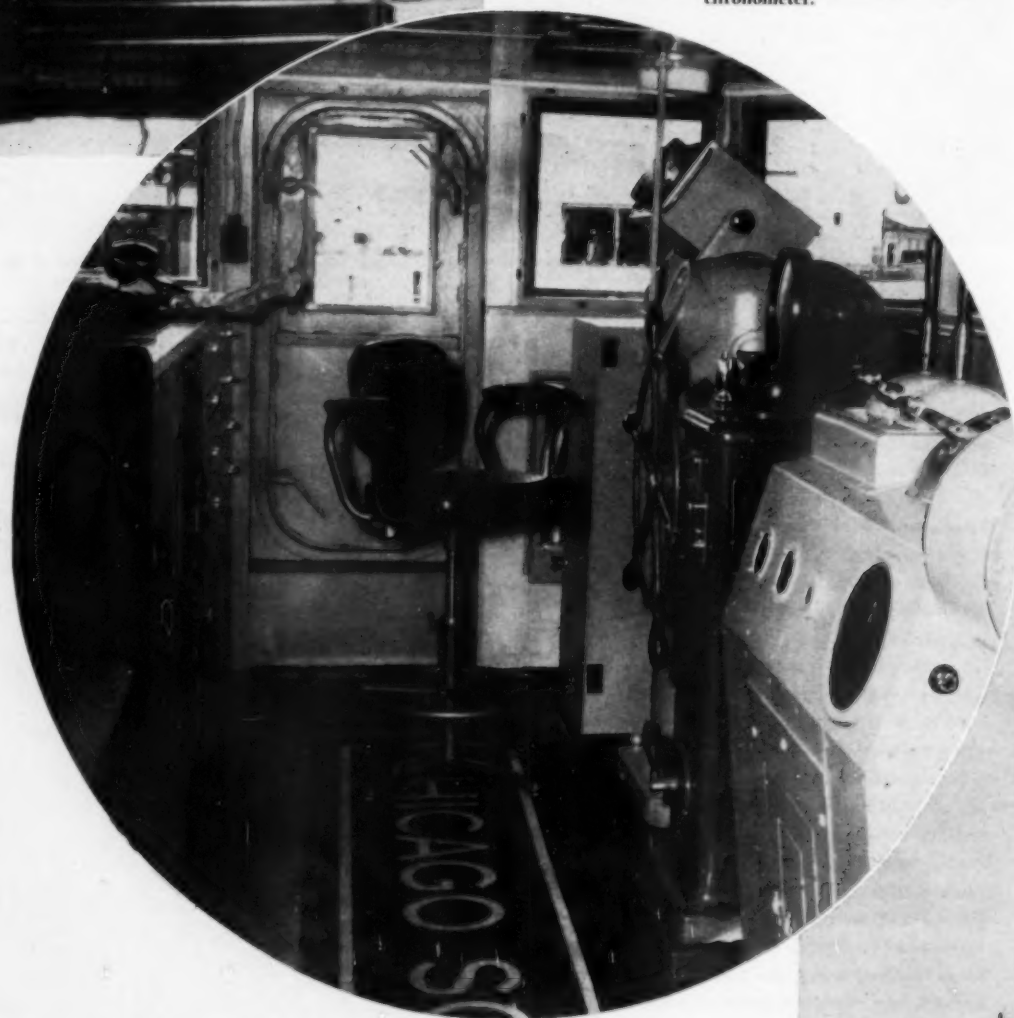
Three Main Cargo Pumps Cargo System.....	1,400 gpm. at 75 psig. each
Stripping by the three main cargo pumps	
Segregation—3 groups (1,2) (3, 4) (5, 6)	
Cargo Suction Lines, Main.....	10 in.
Cargo Discharge Lines, Main.....	8 in.
Heating Coils in all cargo tanks.	



Another view of the *Chicago Socony* under way in the Houston Ship Canal.

ometers for both pilot house as well as engine room with the pilot house indicators equipped for night lighting and visible in the wheel house by means of low intensity indirect lighting. Air inlet filters for each engine were manufactured by Air-Maze and each engine was equipped with fully automatically operating alarm systems to indicate high water cooling temperatures or low lubricating oil pressures. The exhaust from the two main engines, three large generators and two large boilers presented a considerable problem in the engine room arrangement. This resulted in a twin stack arrangement where the exhausts are carried into two vertical leads just aft of the engine room skylight. These vertical leads are of sufficient size to hold not only the exhaust from the main engines and the uptakes for the boilers but also the silencer for the generator. The main engine max. silencers lie outboard of the engines between the aft end of the engine and the stack.

The three service generators for the *Chicago Socony* were built expressly for the job by Griffin Equipment Corporation at their New York shop. Each unit consists of a General Motors Corporation, Detroit Diesel Engine Division Series 6-110, two-cycle engine driving an Elliott Company, 125 kw., 120/240 volt dc., generator through a Thomas flexible disc coupling. The six cylinder 5 in. x 5.6 in. bore and stroke engine having 660 cu. in. total displacement at 18:1 compression ratio with centrifugal scavenging blower employs the GM unit injector and uniflow scavenging system and at the rated speed of this application, 1450 rpm., develops 180 bhp. continuous and, for reserve power, a normal intermittent output of 210 bhp. with a piston speed of only 1354 ft./minute. The light weight and easy starting of the engine on fuel oil without the necessity of starting aids or pre-heaters makes it well suited to this application. Each engine is started by an Ingersoll-Rand vane-type cranking motor engaging the flywheel ring gear and operat-



The pilot house contains a directional finder, radar, radio telephone, May Day monitor, Sperry gyro pilot, Kelvin White compass and chronometer.

ing on air from the vessel's main bottles at between 75 and 125 psi. The engine accessories are unit mounted and engine driven including water and oil heat exchangers, temperature control thermostat, sea and jacket water pumps, fuel and lube oil filters and fuel and lube oil pumps as well as the Burgess-Manning intake air silencer. This arrangement results in a compact and easily serviceable installation.

Each engine exhausts into a Maxim MSC-1 spark

Stern view of the *Chicago Socony*, just off her builder's yards.

TABLE II

List of Machinery

2 Superior Model M3x-6, 6 cylinder

3 Generators

General Motors Diesel 610 Model 62402 RA driving 120 kw., 220V., 3 wire

2—oil fired Scotch Marine Boilers "Wee-Scot" of 20 hp. each for cargo tank heating

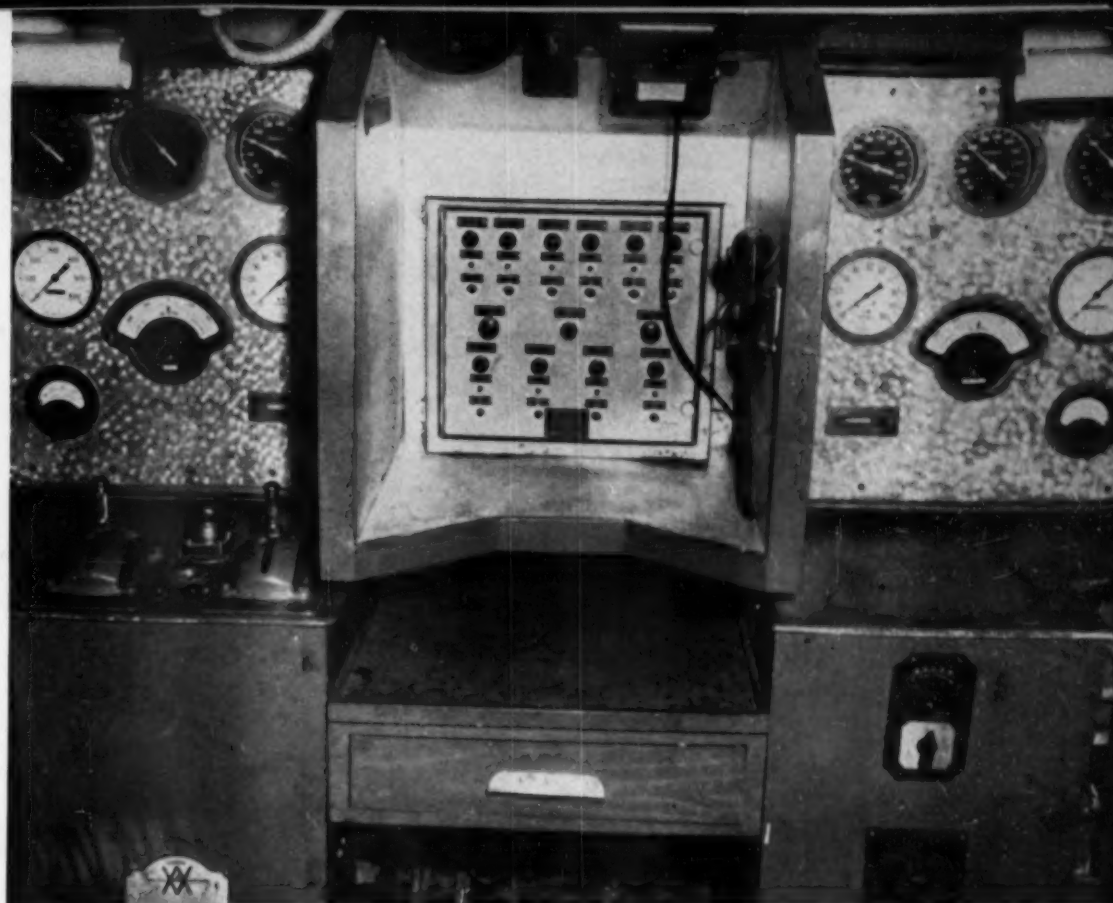
arresting muffler and all three are protected against excessive jacket water temperature or low lubricating oil pressure by a Viking alarm panel which is centrally located and contains a howler plus indicating lights and switches for each engine. The Elliott Company, Crocker-Wheeler Division generators, of two bearing design and in accordance with A.B.S. and Coast Guard requirements are capable of a two-hour 25% overload. Balance coils (auto-transformers) which are separately mounted, provided for 25% unbalance in the three wire electrical system. The fabricated steel bases, rendering the complete engine-generator unit self-contained and self-supporting are light, yet rigid. An additional pair of transverse braces at the forward end of each unit were provided at the suggestion of the Socony-Vacuum engineers resulting in an extremely stiff assembly.

PILOT HOUSE

The pilot house is of the hydraulic retractable type with hydraulic oil reservoir incorporated in a hollow piston and driven directly from the main

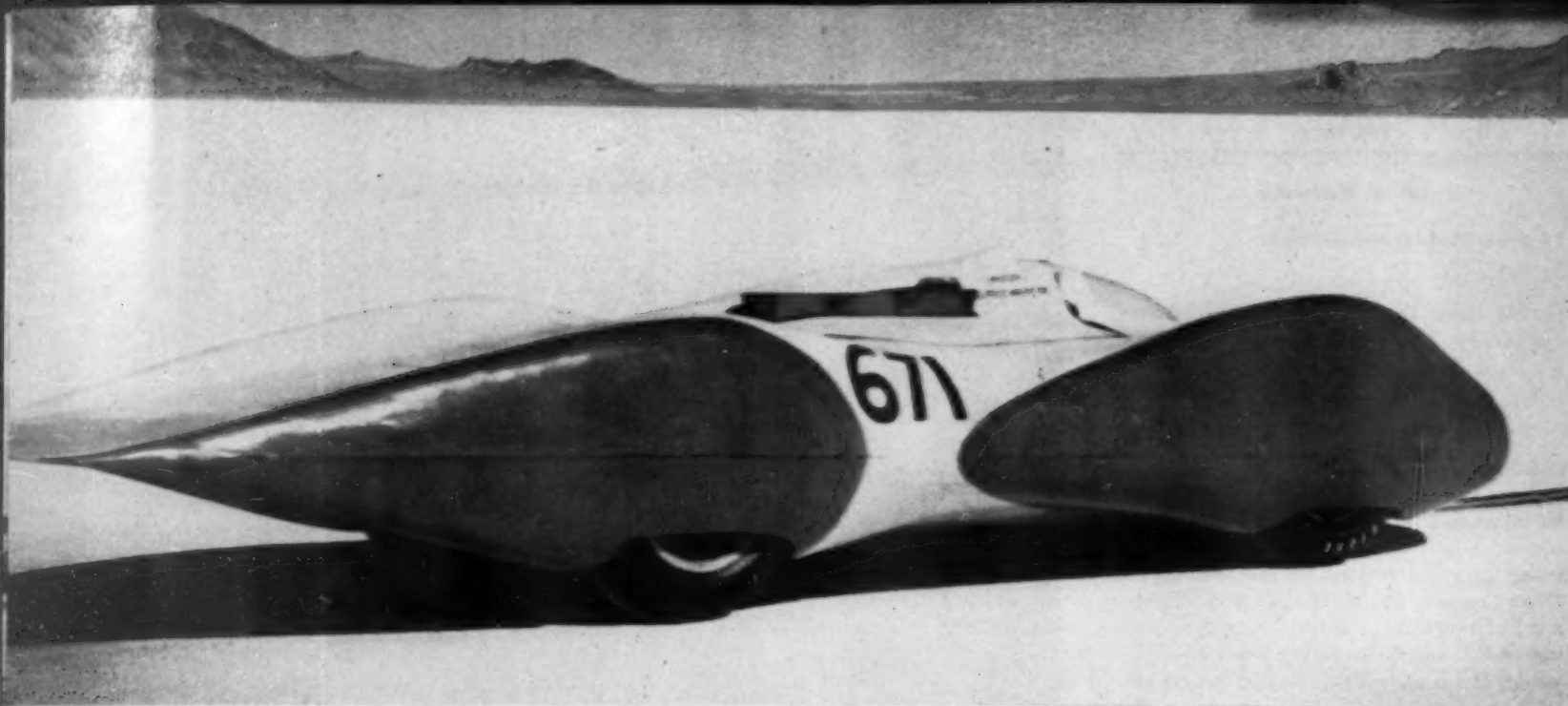
hydraulic system in the engine room. The entire pilot house can be elevated nearly 7 ft. when navigating in open water. When in the lower position and with mast and stacks retracted, the maximum height above the main deck of the vessel is less than 8 ft. The leads to the pilot house for all purposes

including navigation, radar, telephone, are carried into the house on flexible cables from the fore and aft walkway. The pilot house navigation instruments are as follows: Directional Finder, radar, radio telephone, May Day Monitor, Sperry Gyro Pilot, Kelvin White Compass, Chronometer.



The engine room control station showing Weston tachometers, Alnor pyrometers and Westinghouse Air Brake controls.





The Fuller diesel car as it started its world record shattering run at Bonneville Salt Flats.

MODIFIED GM DIESEL SETS SPEED RECORD

By DOUGLAS SHEARING

TWO months ago, a man got into his stream-lined, dieselized racing car and roared across the Bonneville Salt Flats to chalk up a new international endurance and speed record. The car was driven by Dana Fuller, Jr., one of the co-owners. The engine was a modified GM Model 6-71. This diesel pushed the car up to a searing 169.32 mph. to achieve the record.

The engine, basically a General Motors Model

6-71, has a special aluminum block which was manufactured in Detroit. It is a stock block, cast in aluminum for lightness. The driver-owners installed a special unit injector—special with respect to size, a GM 120. The cam was a special one in that there is more overlap on valving and valve timing and the injection was also advanced. Compression ratio was increased to 18:1. A standard cast iron head is used on the engine. For weighting, the gear housing was eliminated and a fiberglass gear housing

installed around the ends of the timing gears, etc. Regular Mobil diesel fuel was used.

The GM Model 110 centrifugal blower was mounted on the end of the diesel and the discharge from the centrifugal blower was fed directly into the standard Roots blower. There is no intercooling on the air. The cylinder liners were modified in that square or rectangular ports are used rather than circular ones. This gives better air flow, more turbulence and better scavenging. The blower boost into the engine is approximately 25 pounds. The turbo blower is geared to 25,000 rpm. (about a 10 to 1 gear ratio). The final drive ratio is 1.12 to 1, practically a 1 to 1 ratio. For cooling a standard water circulating system with one expansion tank and a cross cooling system without a radiator is used. Cooling, incidentally, is one of the factors the owners plan to investigate further.

The lubricating system consists of a lube oil pump mounted external to the engine with an auxiliary sump separate from the engine itself. Oil pressure is increased to approximately 80 pounds psi. All bearings are hand fitted.

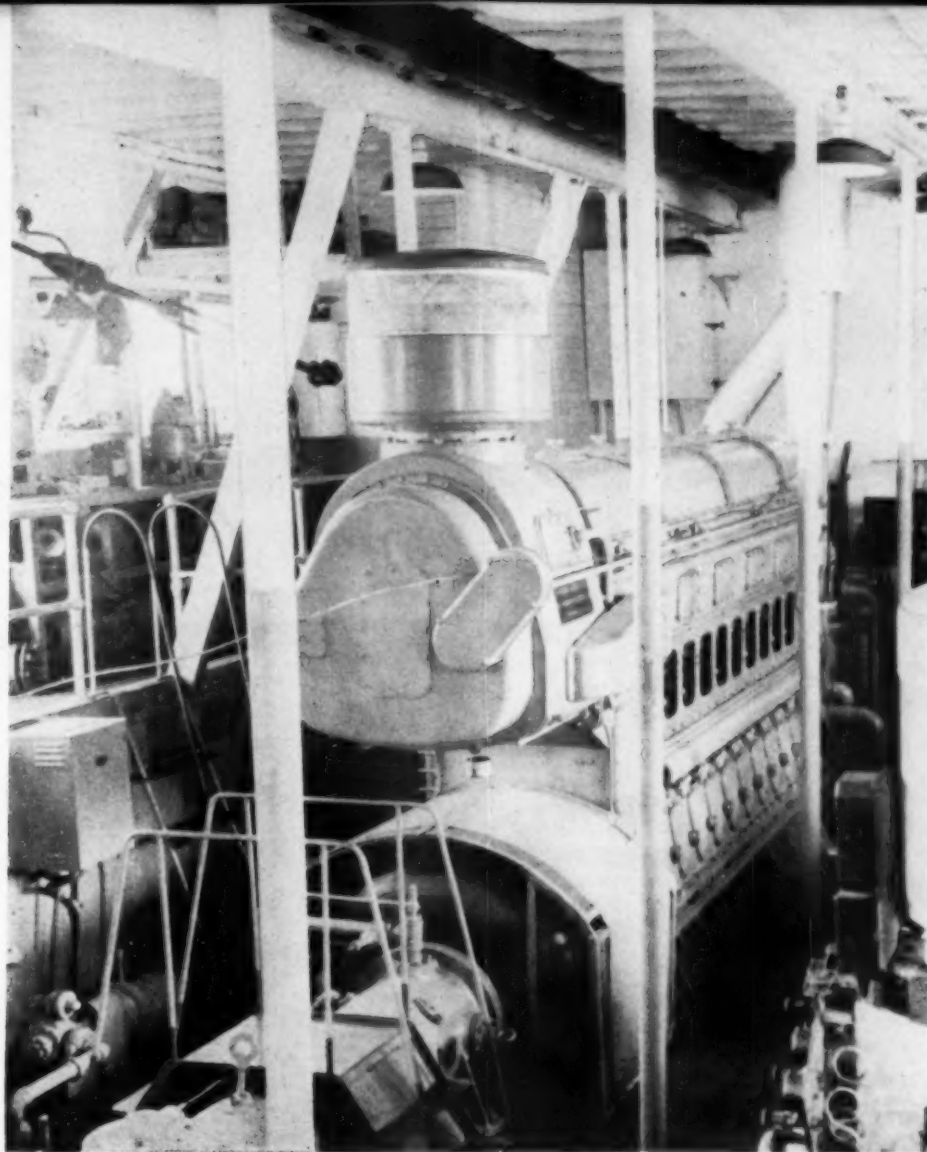
The engine is rated at about 325 hp. at 2500 rpm. and is capable of doing 2700 rpm. The maximum rpm. during the run at Bonneville was well below this which indicates considerable reserve. There is a good possibility that the car will race again next year and do much better, probably above 200 mph. The previous year, the car was driven by Chet Herbert, the other co-owner.

The car has a fiberglass body for speeds up to 275 mph. The design is a proven one. Total weight of the car, driver and engine is about 2800 pounds.

Owner-driver Dana Fuller, Jr. aids technical inspection of his record breaking diesel by Reeves Dutton, American Automobile Association official.



View of the Fairbanks-Morse 1600 hp., opposed-piston diesel engine in the Huffman dredge, the R.C.H. No. 3.



This engine room view of the Fairbanks-Morse 1600 hp. engine shows the Michle-Dexter supercharger in the foreground with the fluid coupling installed immediately underneath it.

DIRECT DIESEL DRIVE ON DREDGE

**Fairbanks-Morse Opposed-Piston Engine Powers
16 in. Pump, Sets Production Mark; Same Diesel
Will Drive 18 in. Pump, Boost Capacity 30 Percent**

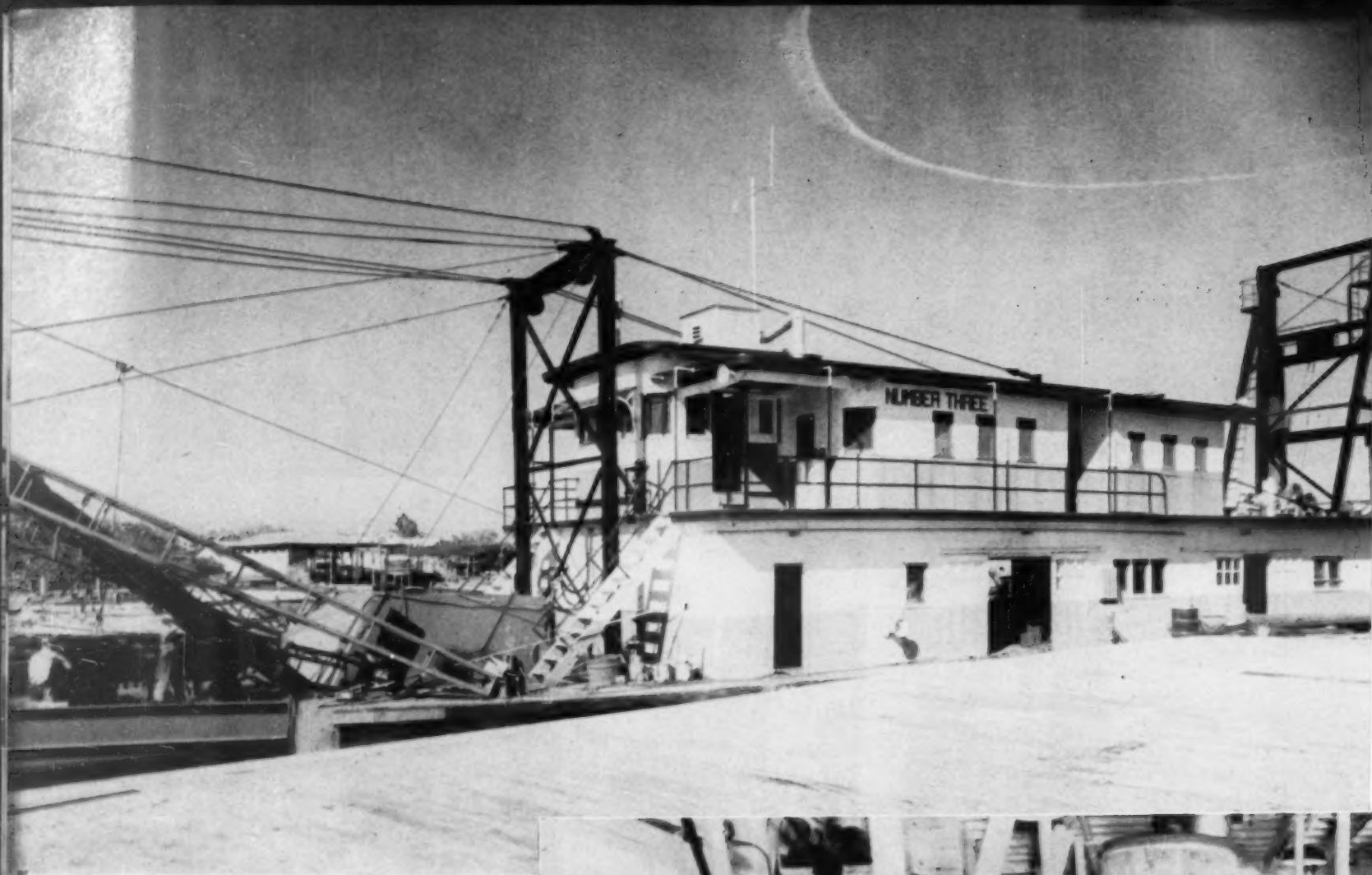
By DOUGLAS SHEARING

A DREDGE operating in Florida waters has demonstrated above-normal work capacity with an opposed-piston diesel driving a 16-in. pump through a flexible coupling. The R. C. H. No. 3, owned by R. C. Huffman Construction Co. of St. Petersburg, Florida, showed what it could do in the construction of 27 miles of beach, 300 feet wide, along the northern Gulf Coast. Another company cooperating in the project utilized a big dredge with 20-in. pump while Huffman used the No. 3 dredge with 16-in. pump driven by a Fairbanks-Morse Model 38D8-1/4, ten-cylinder, opposed-piston diesel. The small rig, with 16-in. discharge line, pumped within 20 percent of the production of the big dredge with its 20-in. line.

With suction at 20-in. vacuum and a discharge pressure of 90 psi., the 16-in. pump could handle more than 12,500 gpm. The diesel is rated at 1600 hp. at 720 rpm., but the limitation of the pump kept regular operating speed to 550 rpm. Yet, even with these limitations, the dredge nearly matched performance of its bigger competitors. But that's not the whole story. The smooth, effective performance of the opposed-piston diesel in handling the 16-in. pump convinced Huffman engineers of the practicality of direct diesel drive for dredge pumps. They also concluded that the OP diesel was capable of handling even heavier loads. At this writing *Number Three* is being equipped with an 18-in. pump that will have a capacity 30 percent

greater than the present pump. The same F-M diesel will power the new pump, now being fabricated in Huffman's shop from their own design. The new pump will operate at 550 rpm. behind a 5 ft. diameter by 5 ft. pitch cutter suspended from the hydraulically controlled ladder. This welded steel cutter, hemispherically shaped, is mounted on a 9 in. diameter shaft that turns at a minimum speed of 16 rpm. and a maximum speed of 27 rpm. It is driven through a gear reducer by a 200 hp. variable speed slip ring motor.

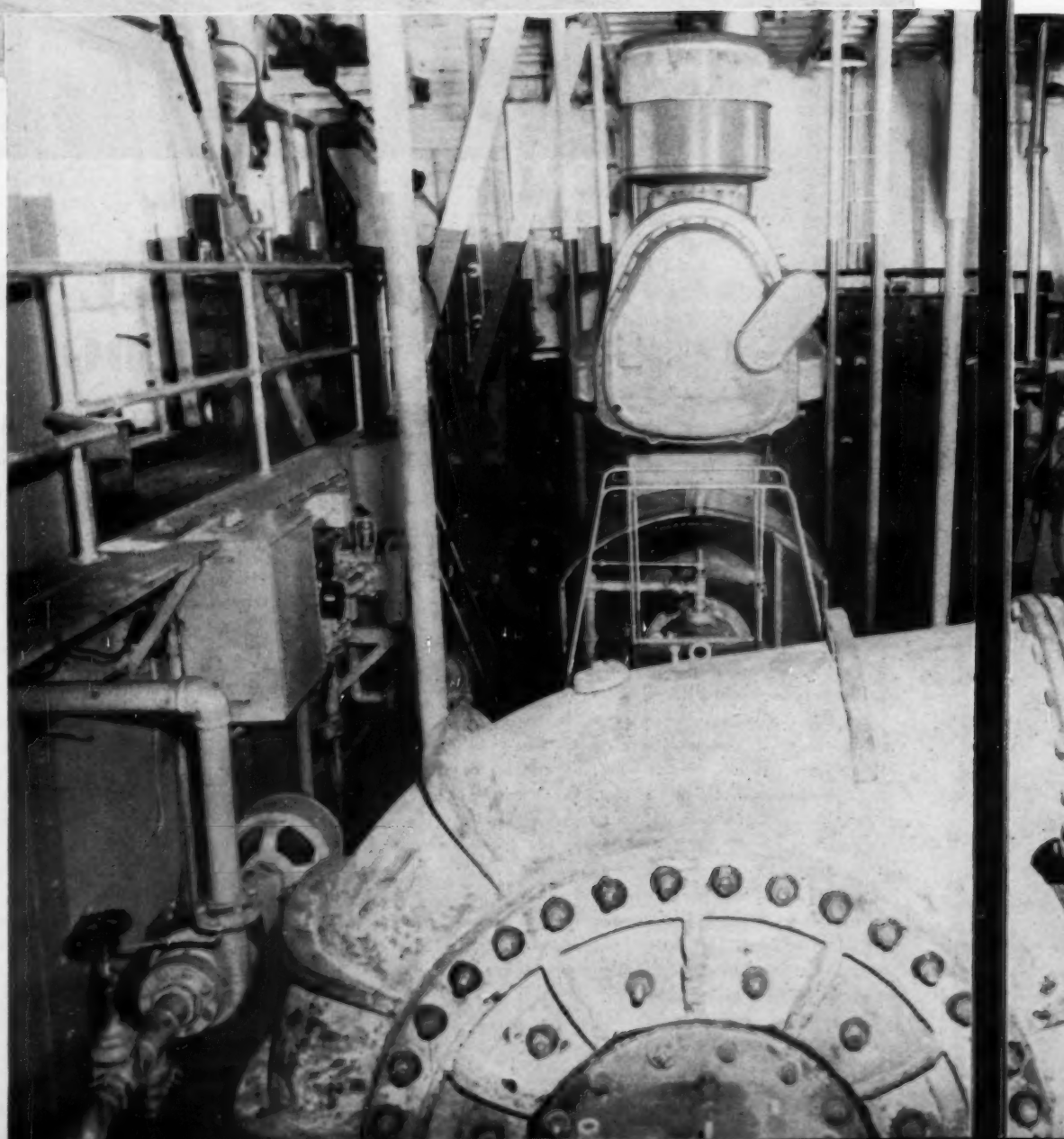
Operating at a vacuum of 20 in. of mercury at the suction, the new pump will discharge at more than 100 lbs. pressure, enabling it to pump 16,000



Above: Tied up to the dock, the F-M powered dredge undergoes conversion to increase its pumping capacity 30%. *Right:* Engine room shot showing the compact O-P dwarfed by the pump it drives. New pump will be larger and increase the capacity by 30%.

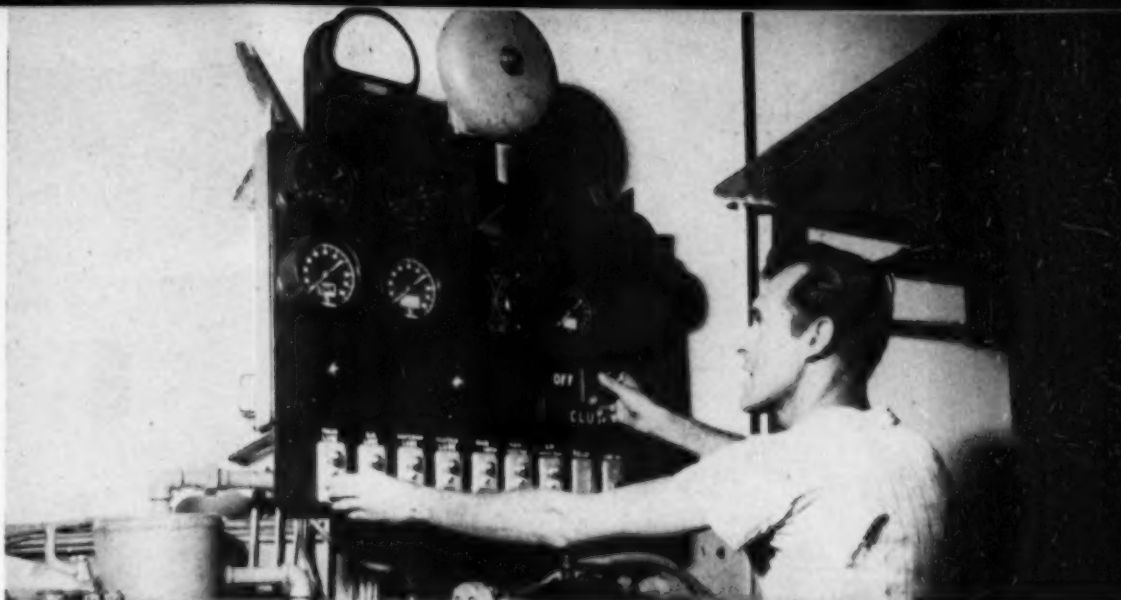
gallons per minute through 18 in. discharge lines ranging up to a mile in length. The new pump too will be direct-driven through a fluid coupling which minimizes the possibility of engine damage in the event that the pump is jammed by debris. The pump handles a mixture of water and whatever constitutes the sea bottom at the point where operations are in progress. The usual bottom is sand or silt and the solids content of the pump effluent will, in this case, run to as high as 25 percent of the mixture. The solids content when shell dredging will run lower. Shell dredging accounts for much of the dredge's work load, since gravel is a non-existent commodity in Florida and shells are in great demand for road base material. Other work, done with the old 16 in. pump, has included such projects as the building of the southeast causeway leading to the new Tampa Bay Bridge. The pumping distances on this job ranged from a minimum of 2000 ft. to a maximum of 5000 ft.

Of particular interest is the part played by the Huffman Construction Co. in the development of land in the St. Petersburg-Tampa area. As is often the case in Florida, a lot of otherwise desirable property is at such a low elevation as to be unsuitable for building purposes. With the demand that exists for property fronting on the Gulf of Mexico, Huffman's dredges have been kept busy



building the many artificial peninsulas that line the coast and provide the solid ground necessary for home construction. The wilder aspects of the land boom are a matter of the past and companies with established reputations are selling developments from plans and dredging up the sea bottom to provide land "made to order."

Number Three is the latest of three F-M powered barges owned by Huffman and it is also the most powerful. The *Broward* and the *Dania* are powered with Model 37D14 Fairbanks-Morse diesels. Both drive 16 in. pumps. The design of *Number Three* is purely functional and there is not a bit of waste space aboard. The compact design of the opposed piston engine was a big help in providing working space in the engine room. Also housed here are two more diesel engines which drive 220 volt d.c. generators to run the cutter motor and the pumps for the complex hydraulic system. The hydraulic system controls the ladder which carries the cutter and regulates the depth at which it works. The spuds, big stilt-like affairs that move the dredge once it has been towed into position, are also hydraulically controlled. Just forward of the engine room and at deck level is the workshop area where all repairs are made. A complete set of hand and power tools is available, making the dredge virtually self-sufficient. To the rear of the engine room are the mess and the all-important galley. The pilot



Chief Engineer Alex Marko demonstrates control panel he designed and built. Pump switches at bottom have red indicator lights to warn of pump or motor failure while large bell at top sounds audible alarm.

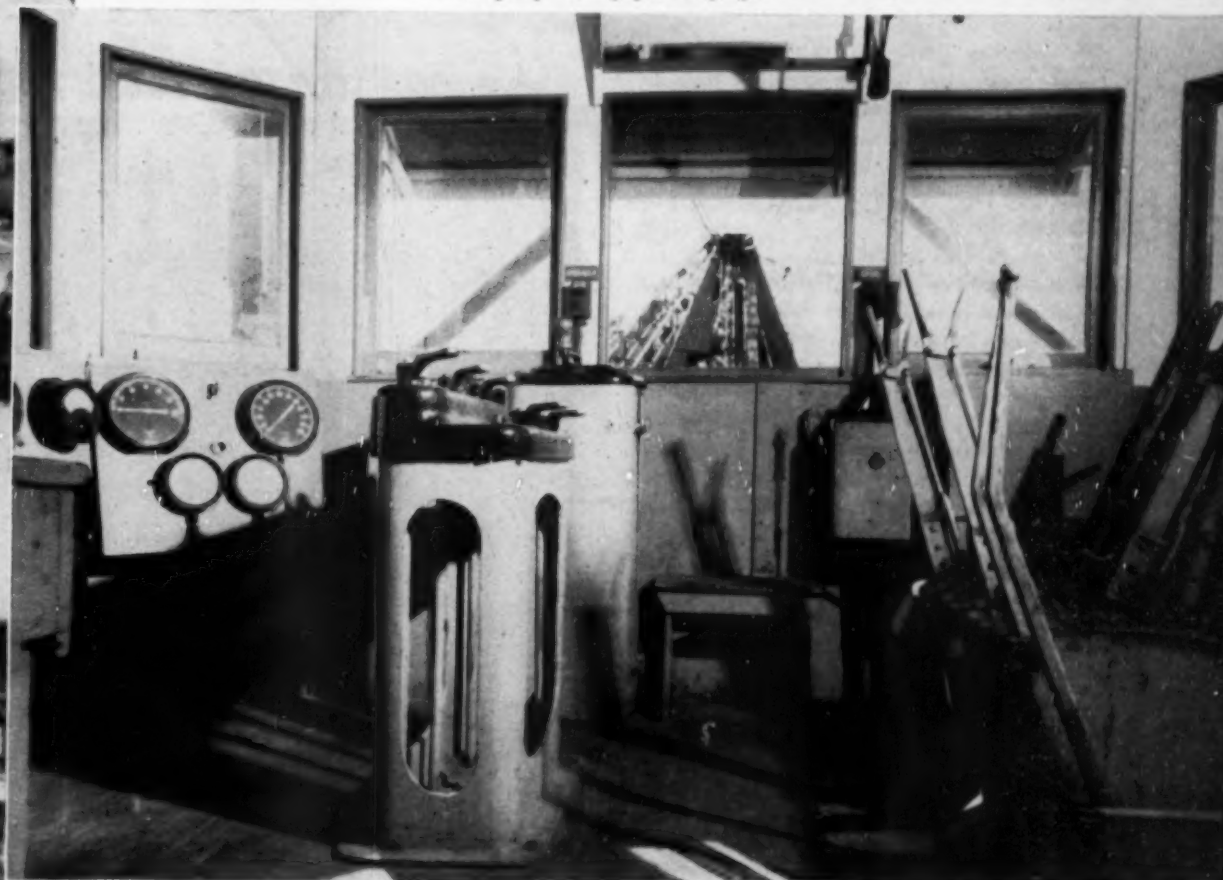
house is located on the upper deck where it commands a good view of the ladder and the electric motor that drives the cutter. Aft of the pilot house are the crew's quarters.

The pilot house is interesting in that its location above the pump room permits direct control of the hydraulic system. This eliminates the signal system generally used. It not only saves time but also eliminates any chance of having a man in the pump room misinterpret signals. Engine room instructions are relayed with a standard signal system. Engine instruments are mounted on a control panel designed and built by Alex Marko, chief engineer, while the pump suction and pressure gauges are duplicated, one set being on the control panel

while the other is located in the pilot house. The control panel mounts the switches that control the lube oil pumps for the diesels, the lube oil pump for the clutch, and the cooling water pump. Should any of these pumps stop while the unit is operating, a bell will ring and a light will indicate the pump which has failed.

Number Three was built by the Ellicott Machine Corporation in Baltimore, Maryland. With its opposed-piston diesel driving the 16 in. pump since 1950, the dredge has piled up some notable work records. When the new 18 in. pump is put to work, Huffman confidently expects the diesel-driven unit to exceed all previous production marks by an impressive 30 percent.

The control room is well-equipped. Gauges at left are engine tachometer, pump suction and pump discharge pressure gauges.





View of the Johns-Manville Lompoc plant where skilled management and dieselized equipment unlock the marine deposits of 15 centuries to employ thousands in processing many products for civilized living.

NATURE is truly wonderful, and she is made more wonderful when modern industry powered by the best diesel tools, operated by skilled and happy workers, and managed by experienced company executives, develops the shortest distance from earthbound raw materials to consumer. Up on the "White Hills" that separate Lompoc, California, from the broad Pacific, the writer recently re-discovered the works of one of the Nation's industrial giants he had noted a quarter century earlier as a mere white patch on the scenery. Here Johns-Manville has one of its 22 mine and plant operations, one of four in California alone. Johns-Manville manufactures more than 400 lines of products, comprising over 20,000 items, with company-wide sales of close to a quarter billion dollars a year, I learned at the Lompoc Mine. Here the finest combination of capital, management, accumulated know-how, with the latest post-war engineering and research is unlocking the maritime deposits of 15 million years ago to serve modern living standards.

Diatomite is the name of the fossilized skeletons of the vegetable ocean life laid down through the ages and now being mined by dieselized equipment in the modern open-pit operations on top of the hills. Celite is the Johns-Manville trade name for the product mined and processed by 650 skilled workers who make up much of the Lompoc Valley population, with homes and retail trade to build a growing and prosperous community. This largest diatomite mining and processing plant in the world was a mere small hillside quarry fifty years ago. Ten years earlier, the owner didn't think his holdings were worth paying the taxes on as two of his sons dug out by small hand tools, amounts of the material for fire lighters that were shipped to San Francisco.

Plant Manager O. B. Westmont was found busily getting ready for a J-M plant open house for the community and outside visitors when seen at his office. It was the 60th Anniversary celebration and a good time to glance back at history and note

progress while showing the modern industrial methods of today, and the facts of the economic place of the company in the community where its 650 employees live, work and advance in plant and community. Mr. Westmont mentioned that J-M has a continuing program to improve working conditions and safeguard the health of employees. The supervisors of this strip mining operation have helped develop this high efficiency level of operation which has mainly resulted from the many years experience in this phase of work. This experience has been in both operating and supervision which has acquainted them intimately with all types of operating problems. The supervisors of the Lompoc operation are: G. G. Schuknecht, superin-

tendent of quarries and mines; E. Hodges, assistant superintendent; O. C. Benedict, general foreman; H. Paaske, foreman. All have worked very closely together as a supervisory team in conjunction with each individual man on the job. The results of this close cooperation are evident in this very apparent successful operation.

The company has already spent one million dollars on improvement of working conditions, and is spending more. Evidence of these improved working conditions can be seen immediately in the open pits of J-M's Lompoc Mine and in the dieselized equipment dishing up the diatoms to keep a steady stream of big Euclid trucks rolling to and from

Panoramic view of the Johns-Manville diatomaceous deposit banks. A Cummins-powered Euclid is pulling a bottom-dump at right. A Caterpillar D8 is in the center. Left is an



**Johns-Manville Mines
Pacific's 15-Million-
Year Old Diatomite De-
posit in Lompoc's White
Hills with High Produc-
tion via Group Incentive-
Safety Program**



A GM truck rigged for field service is on the job servicing the Allis-Chalmers HD19 pulling the Euclid loader on the Lompoc strip mine operation. This veteran GM powered Allis Chalmers HD19 was the first on the West Coast equipped with Twin Disc torque converter.

loader and power shovels. Here is the list of the latest and most effectively equipped open-pit mining machines the visitor has seen in seven months' visits to the big strip mines of Arizona, Nevada, Oregon and California:

5—GMC trucks for dump, service wagon, tractor, semi-trailer, etc. 14—Euclids—4 Rear Dump, 10 Bottom Dump, with 4 GMC and 10 Cummins engines; 165-200 hp. 6—Caterpillar Tractors—3 D8's, 3 D-7's. 1—Allis-Chalmers HD-19 with GMC engine and Twin-Disc torque converter. 1—Allis-Chalmers Blade Grade Model AD-3. 1—Caterpillar Blade Grader—Model 12. 1—Euclid Loader with Cummins engine.

Allis-Chalmers HD19 with GM engine and Twin Disc torque converter pulling a Euclid loader filling a Euclid truck. In the background, left, is a P&H shovel loading another Euclid truck.

The HD-19 was one of the first used on the Pacific Coast for towing a Euclid loader. In the mine office we went over lubrication check sheets that showed how the equipment is serviced to keep it rolling at top efficiency. We had noticed the safety slogan on a bumper of a truck up on the job. Here as we exchanged questions and answers on service, came the real story of Johns-Manville's success in this modern industrial world of mine-to-market. The casual words "Crew Group Incentive" and "Crew Safety Program" brought up the big story for users of modern equipment—1,584 days without a lost time accident. There are two key programs set up by J-M management that are worthy of study by any user of modern high speed heavy duty equipment

in any strip mining, dirt moving, logging or allied operation. This observation was made by the writer after visiting and studying such rugged work over the past quarter century. So, Johns-Manville engineers were prevailed upon to state these programs for DIESEL PROGRESS readers: "A group incentive plan has been in effect since 1949. The dozer operators, shovel repairmen, water wagon operators, grader operators, and equipment trainer, as well as the shovel, loader and truck operators, participate equally in this plan. The incentive is calculated weekly, and covers such items as cubic yards moved, distances traveled, grade roads and pit conditions, type of loading and dumping equipment, and maintenance costs. Earnings due to the incentive plan usually are about 25% of base earnings. The objective of the incentive: Work smarter; not harder."

"Mr. G. G. Schuknecht, assistant plant manager and superintendent of Quarries & Mines Department, should be given recognition for the efficient organization, performance and accomplishments of our Quarries & Mines," insisted plant manager Westmont when he looked over the writer's first draft of this story of J-M's Lompoc operations. "Mr. Schuknecht has supervised all operations of that department during the past several years."

The big shops and stalls of some of the open pit copper, sulphur and zinc mines, where some were full of \$35,000 to \$60,000 trucks being repaired from rough use by green drivers, careless backing of dump trucks over the dump, fast dropping of 5-ton boulders on trucks to bounce front ends of bodies and smash diesel engine fronts on the down bounce, came to mind from visits to frontier mining operations the past few months. What a saving could be made in some of those mines by such a plan as J-M has smoothly working. In addition, read the "Truck and Shovel Crew Safety Program": (1) All crew members participate by submitting safety suggestions to a committee comprised of supervisors and hourly employees. Their suggestions are judged and awarded points by their Safety Committee. Quarterly and annual prizes of govern-





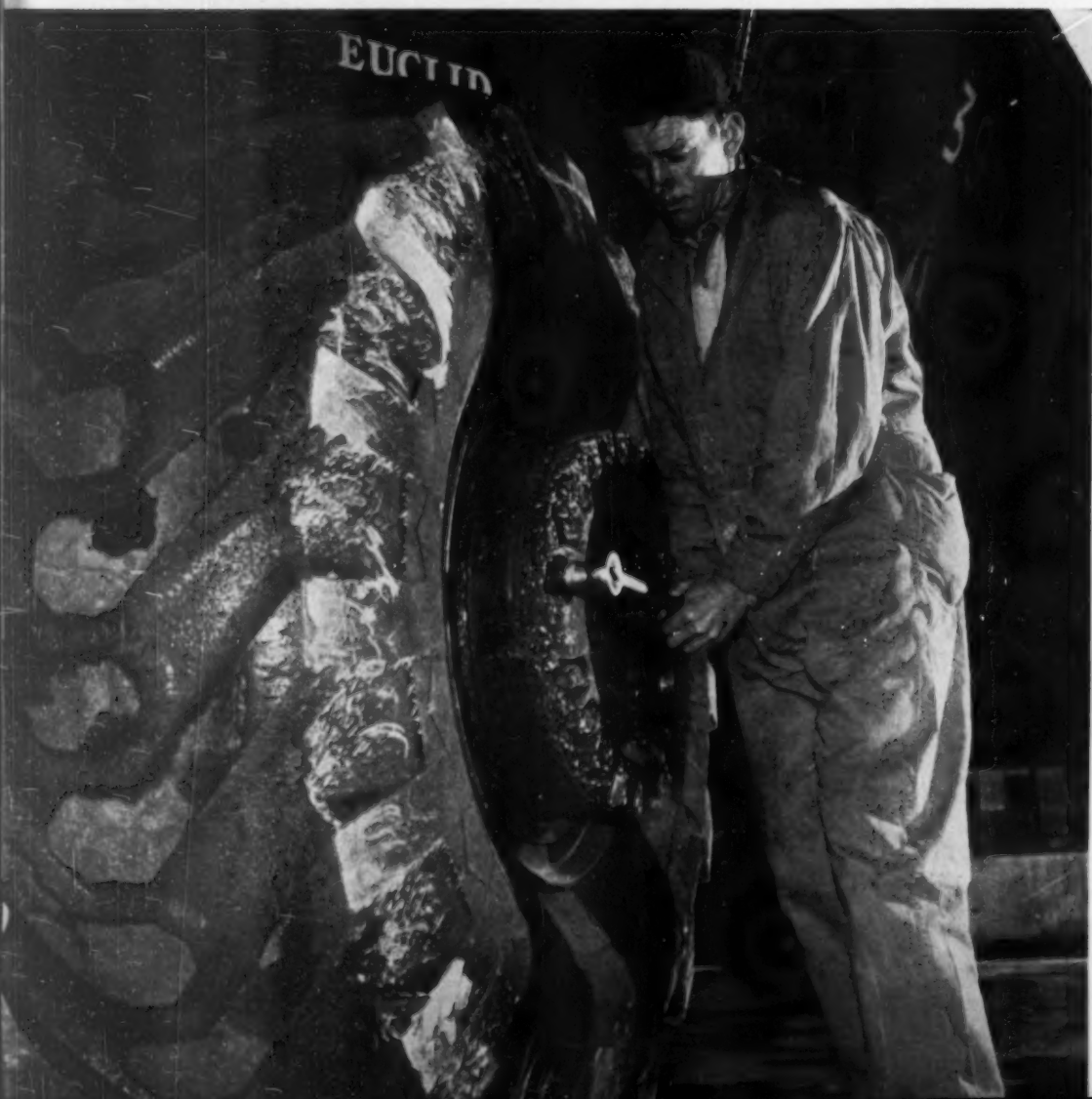
This Caterpillar D8 is ripping up overburden at the Lompoc Strip mine.

ment bonds are awarded to employees earning the highest number of points. (2) Violations of the Truck & Shovel Crew Safety Rules are judged by this committee, and the violators are penalized by the loss of an appropriate number of points previously earned. (3) A safety Slogan Contest is conducted each quarter with safety slogans submitted by crew members. The winning slogan is chosen by

the plant manager, who presents the prize. The slogan is then painted on the bumpers of the J-M trucks to serve as a constant reminder to work safely.

"To date (July 1, 1953) this crew has worked 1,584 days without a lost time accident." All of the open pit mining equipment, with the exception of the

A Johns-Manville shop service engineer tightening bolts on one of the giant Goodyear tires on a Euclid truck. Fourteen Euclids are operated at Lompoc, four powered by GM's and 10 by Cummins.

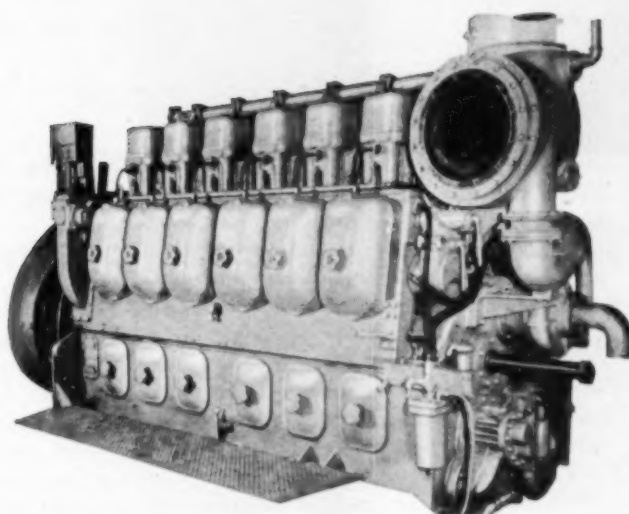


Euclid trucks, are serviced in the working location in the open pit. This servicing is accomplished by a two-man service crew with the aid of a specially designed service truck built by the Jax Manufacturing Company of Pittsburgh, Pennsylvania. This unit is equipped with a dual set of hoses, one set located on each side to handle every field requirement from air to refueling. The hose reels and all containers are mounted so that the men do not have to reach up high, but are working at reasonable levels to facilitate ease of servicing. Each piece of equipment in the field serviced by this service crew has a check sheet for the required lubrication for that particular piece of equipment for that shift. The check sheet may be one requiring daily service, 60 hours, 120 hours, 600 hours or 800 hours, depending upon what is required.

Actual hours of operation are kept on a separate sheet in the office, and a flag is pulled on a particular piece of equipment that is within ten hours of having a longer than daily service requirement. On this spread sheet any use of lubricants other than normal requirements are noted. This gives a case history of excessive use of gear case lubricants, engine lubricants, oil usage, etc. and serves as forewarning for anticipated minor repairs which are handled under the preventive maintenance program. The close coordination and accurate records of actual operating hours, and maintaining a high standard of field servicing, has contributed greatly to the high percentage of equipment hours worked against the scheduled hours. Likewise there have been no failures of any parts of any of the equipment that can be contributed to lubricating failures during the past four years, and has improved the preventive maintenance program in catching repairs at an early stage, thus minimizing more costly repairs resulting from failures.

So every operator of the high speed mechanized equipment knows what his machine is doing and is financially aware of the importance of keeping it operating at top efficiency. He is part of the team and feels he has a stake in raising the J-M production with his machine. He knows that his fellow workers on similar machines, as well as the management from shop superintendent and pit foreman up to the plant manager, on back to company officials, are all on the same team trying to lift company name and widen use of its products by better labor relations via incentives and safety programs such as they see and feel in the cabs of their trucks. Here the drivers themselves recommend ideas for safer driving of the big loads, more comfort by use of adjustable seats, air conditioners for dustless breathing, warm cabs in cold and cool driving in hot weather. The moving safety slogans that one of them has coined in thinking over their problems flash before their eyes as they work on the job. And these slogans change from contest to contest to prevent their monotonous repetition. Maybe Bill Jones can boast to his family and neighbors that he coined the slogan that is on all the J-M trucks at the moment, but John Silva may have the honor next month when the slogan he has been thinking up gets the award. It keeps them all safety conscious, and the proof of results is in the plant manager's statement on 1,584 days without a lost time accident.

Presenting...
the heavy-duty, lightweight
ALCO 251-A
all-purpose diesel engine



**ALCO 251-A
SPECIFICATIONS**

Size: 6-cylinder
Bore: 9"
Stroke: 10 1/4"
Cycles: 4 turbocharged
Horsepower: 690
Rpm: 900
Net weight (engine only):
21,350 lb dry;
22,500 lb wet

**TYPICAL
APPLICATIONS**

Oil-well drilling rigs
Crude oil pipeline pumping
Products pipeline pumping
Gas pipeline pumping
Electric power generation
Irrigation pumping
Dredging
Portable units mounted on
skids, trailers, rail cars

The Alco Model 251-A — an in-line, 9 x 10 1/2-in. diesel engine designed for a variety of stationary or portable uses in continuous or standby service—incorporates Alco engineering and experience gained in the manufacture of the famed "244" V-12 and V-16 engines of the same bore and stroke. The 251-A combines heavy-duty output with light weight, ease of maintenance, and low operating costs.

Special Features Include:

- ★ Engine base and frame of structural steel—lighter weight permits lighter, more economical foundations.
- ★ Compact design (11 ft 5 in. long, 4 ft 11 in. wide) — saves floor space.
- ★ All wearing parts easily accessible.
- ★ Lube oil sump, pump, cooler and strainers, and circulating water pump, are integral parts of engine—for low installation cost.
- ★ Arranged for Dual Fuel by adding parts—not by replacing parts or rebuilding engine.
- ★ Started by air motor, on as little as 60 lb air.

- ★ Free end has extension driveshaft for auxiliaries (radiator fan, air compressor, etc.).

Additional details are given in Bulletin DE-2, which your nearest Alco sales representative will be happy to send you, along with complete information in terms of your own specific requirements. Contact him at New York, Beaumont, Chicago, Cleveland, Houston, Kansas City, San Francisco, Schenectady or St. Louis.



THE MARK OF MODERN ENGINEERING

ALCO DIESELS

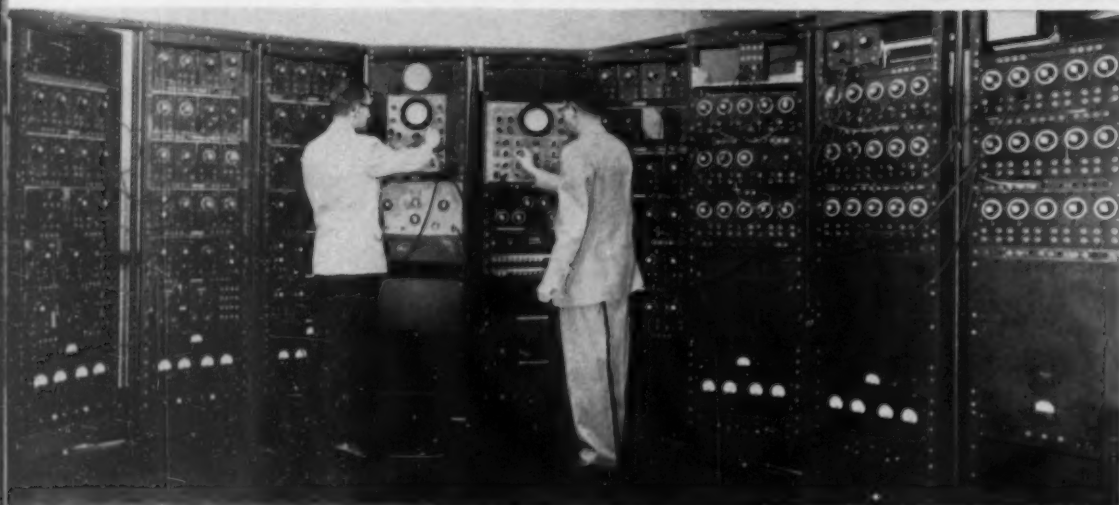
AMERICAN LOCOMOTIVE COMPANY
SCHENECTADY, N. Y.

PRIME MOVER CONTROL CONFERENCE

By BRUCE WADMAN



W. H. (Bill) Whitehead, sales manager of Woodward, pointing out the operation of the analog computer on a transmitted picture screen at one of the general sessions of the Conference.



View of the analog computer and oscilloscope.

THE Seventeenth Prime Mover Control Conference was held at the Woodward Governor Company plant at Rockford, Illinois September 8 through 11, 1953 for the purpose of studying water turbine, diesel and gas engine, and aircraft propeller and aircraft engine governing. Engineers, power plant operators, and maintenance supervisors—155 of them—registered this year for the sessions. They came from all over the world to attend the school—asking questions and seeking solutions to their operating problems.

This year the school opened with a tour of the plant and greetings from Irl C. Martin, President of Woodward. All members of the conference group then attended general sessions on the development of a governor and the basic principles employed

on governing prime movers. The groups were then split up into sessions on hydro equipment, diesel—including railroad diesel, and aircraft control problems. The diesel sessions dealt with the construction, problems, and operation of the Model UG8, UG32, PG, and PSG hydraulic governors. Sessions consisted first of lectures supported by the use of schematic and pictorial illustrations; then the actual work of getting hands dirty in the shop and becoming familiar with the assembly and workings of a governor completed the course of instruction. Three days of intensive study of problems in the field proved to be valuable in acquainting the users with the proper functioning of the equipment, and much discussion and questions on operation, maintenance, and general use of governors were brought forth in the sessions.

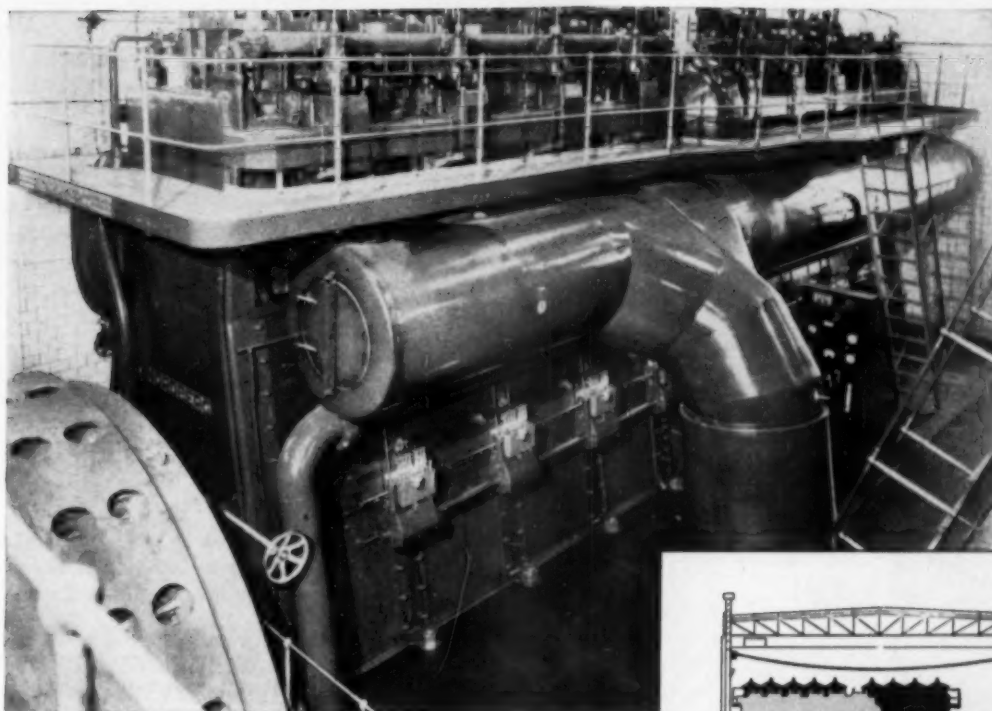
Neal Siedel of Woodward explaining governor assembly to a group of diesel men.



Of special interest in the Conference was the explanation and demonstration of the analog computer at the Woodward plant. This computer is fundamentally a group of electronic units of various types that perform individually certain elementary mathematical operations upon electrical signals being introduced into them. The computer is used to simulate the characteristics of a system to be governed, thus making it possible to analyze governor design and adjustment best suited for the system. The computer is arranged to represent certain mathematical equations that in turn represent the physical characteristics of the system under study.

No numbers are produced, but the behavior of the system is indicated on a cathode ray oscilloscope, which is adjusted graphically and calibrated for calculating actual values. Typical of a simple problem would be the analysis of the speed droop adjustment on a governor in relation to load changes on a particular prime mover. The use of electronic computing methods of this type is illustrative of a trend in the Controls Manufacturing Industry to replace the old methods of "years of experience" and trial and error designing with modern scientific and mathematical computing and analysis. Some main advantages of computers of this type are: 1. It cuts down on "hack" work. In other words, it eliminates time-consuming manual work in solving complex mathematical problems. 2. It is very suitable for qualitative demonstrations for those who do not have the extensive mathematical training necessary for understanding fully the complexities and problems of governing equipment. 3. New designs can be tested by setting up equations to represent the actual physical characteristics, thereby eliminating time-consuming construction of actual units.

Manufacturing and research improvements like the analog computer are among the important forces that contribute to the continuance and growth of our industrial might, and specifically, are factors in improving the efficiency and operation of diesel engines, thereby helping to keep the diesel engine industry young and dynamic.



Shown here is the fourth large, heavy duty oil burning Nordberg 2-cycle Diesel to be installed in the Grand Haven plant . . . a 7000 hp, 3000 kw unit.

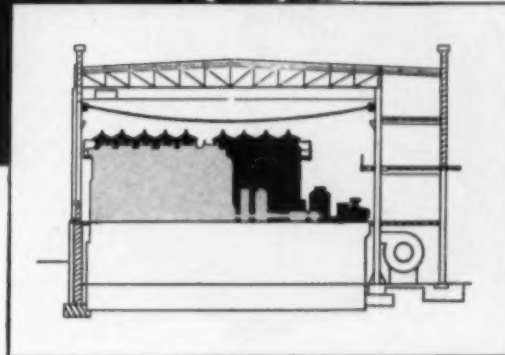
Outstanding economy and reliability of NORDBERG two-cycle DIESELS proved in 15 years of Municipal Power Expansion

Experience of the City of Grand Haven, Michigan, is evidence of the ability of Nordberg Diesel Engines to meet ever-increasing power requirements.

Starting over fifty years ago with a modest steam engine plant, Grand Haven has progressed through turbines, smaller internal combustion engines, and, in the last 15 year period, to the use of large Nordberg 2-cycle Diesels, ranging from 2250 to 7000 hp, as their main power supply. Their recent selection of a fifth Nordberg unit provides further proof of the outstanding reliability of these low speed, heavy duty engines.

It is important to note that the established economy of Nordberg Diesels is further enhanced in the Grand Haven plant through their ability to operate efficiently and economically on heavy, straight-run residual fuel oils. Operating records, covering over a year's operation show, for example, that the 7000 hp Nordberg Diesel has been producing power for an impressive 14.16 kwh/gal. of fuel.

This is another good example of the varied power problems being solved better, more economically with Nordberg Diesels.



MODERN DIESEL POWER GREATLY INCREASES PLANT CAPACITY

Not only has modern Diesel power brought excellent fuel economy to Grand Haven, but it has also given the plant six times as much power installed in a given building section.

The expansion that provided room for the last Nordberg engine, a 7000 hp unit, is almost identical in area to that occupied by any one of the three original 1140 hp Diesel engines.

NORDBERG MFG. CO.
Milwaukee, Wisconsin



THE NICKEL CADMIUM BATTERY

THE battery in heavy diesel motive equipment has always been a necessary adjunct, providing stored power for purposes such as starting, lighting, etc. In design and manufacture, however, the battery, until recently, had not kept pace with tremendous strides in diesel design and application. Basi-

cally, batteries had remained a lead-acid structure with various small improvements being made to extend its life and application to some extent.

In the diesel field, dependable batteries are a prime requisite for the proper availability of equipment.



The ideal battery must offer reliable starting power under all conditions from tropical heat to Arctic cold. It should have long life and be able to withstand the shocks of usage on construction equipment, marine applications and railroad locomotives; be immune to occasional excessive discharges and short circuits; have a low capacity drop at high discharge rates, not generate corrosive gases or sulphate; and be chargeable by low currents.

While the lead-acid battery has achieved a high degree of dependability in many respects, it does not approach these ideal requirements. It wasn't until the comparatively recent availability of the nickel cadmium battery that diesel operators could look forward to a fulfillment of what seemed like wishful dreaming.

One of the pioneers in introducing the nickel cadmium battery is Nife Incorporated. Their batteries have found a quick acceptance and application. In this battery, nickel and cadmium function as the active materials while potassium hydroxide in solution acts as the electrolyte. Its tooled steel container gives it great structural strength. From a chemical standpoint, the active materials are not susceptible to electrolytic attack.

The positive plates consist of nickel compounds combined with other chemical agents to attain maximum conductivity. The negative plate consists of special iron and cadmium compounds. Both positive and negative plates, insulated from each other by hard rubber rods, form a plate unit.

Plates of the same polarity are mounted on a collecting bar which passes through the lug of the steel frame of the plates, evenly spaced by steel washers on the bar. The collecting bars are connected to the terminal posts. The welded sheet steel container is an important element in the battery's construction.

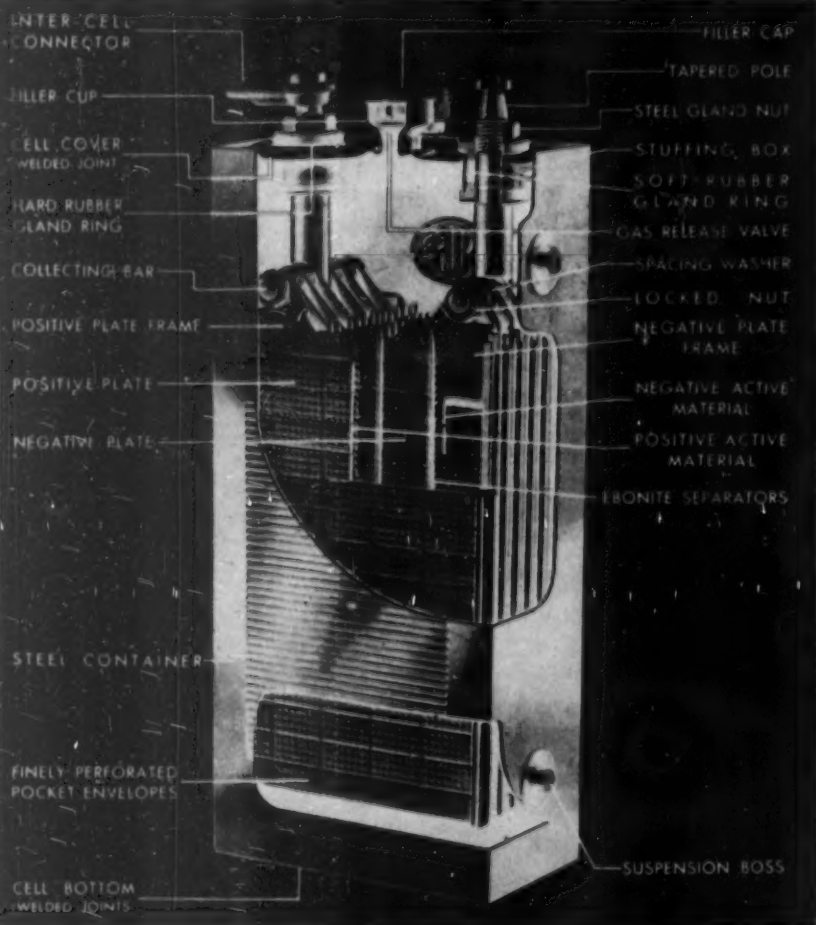
The nickel cadmium battery functions effectively for exceptionally long periods of time. The capacity remains the same after many years of operation. Cases are cited where satisfactory service has been obtained after more than 15 years of continuous operation. Nife asserts although normal capacity is delivered at 68°F., the capacity increases with the temperature. At low temperatures, the capacity is somewhat reduced. At 14°F., it yields about 60 percent of normal capacity. At -22°F., needles begin to form in the electrolyte and only when the battery is completely frozen does it cease to function. Upon thawing, it begins to function again without impairment of its charged capacity.

The critical temperature of -22°F. applies to a specific gravity of 1.17 of the electrolyte. Increasing the specific gravity of the electrolyte gives a lower freezing temperature.

Another feature of interest to equipment operators is the charging rule advanced by Nife. The battery cannot be damaged or its efficiency impaired by overcharging. When the question arises as to whether a battery is fully charged or not, they advise that it be charged too much rather than too little.

Applications such as diesel locomotives require dependable starting. Nickel cadmium batteries supply this need along with long life.

Cross-section of a Nife cell showing construction features.





The Barge GM Service shown servicing two river boats simultaneously. This floating station is complete with office, shop facilities and trained representatives ready to provide direct factory service.

“BARGE GM SERVICE”

THE changing trend from steam to diesel propulsion in river towboats on the inland waterways was evident before World War II. As early as 1941, it was reliably estimated that about 50 per cent of the power on towboats was diesel. With the greater use of diesels during the war period, it is reported that at the present time, more than 85 per cent of power on the Mississippi and Ohio River systems is diesel.

Since engines built by the Cleveland Diesel Engine Division of General Motors are installed in so many towboats, it was necessary to establish a service office in New Orleans early in 1945. All service on the Mississippi was handled from this point. So that better service facilities could be offered to the many manw operators of GM Diesel equipped towboats, it was decided to set up a new service

point at St. Louis in 1949. This service office was located on the barge *Robert McGregor* at the foot of Poplar Street in St. Louis. However, the service business at this location greatly exceeded expectations—from the period of January, 1950, to June, 1953, 375 diesels were serviced, representing a total of 394,310 horsepower.

It was apparent that quick and accessible service was the answer to many of the towboat operators' problems. This year, to provide better service at St. Louis, a Federal Barge Line series 500 freight barge was converted by the St. Louis Shipbuilding & Steel Company as a new and enlarged “service station” for Cleveland Diesel. This barge, *Barge GM Service*, is permanently moored at the foot of Market Street, St. Louis, Missouri. It is registered with the U. S. Coast Guard.

The manager of this operation is P. L. Barrere and George Schulte is area supervisor. In addition to Barrere and Schulte there are 4 Cleveland Diesel service engineers and one parts warehouse man.

This staff guarantees to riverboat operators 24-hour service by qualified service engineers. These engineers supervise and assist in periodic inspections and overhauls of Cleveland diesel engines. As in all Cleveland Diesel service offices, a permanent record is maintained at St. Louis of all engine inspections and overhauls, thus it is possible to consult with the operator when his equipment will be available for the next periodic inspection. This type of inspection is of inestimable value to the operator because he knows the condition of his equipment and permits Cleveland Diesel to maintain a check on the service life of its product.

The warehouse on the Barge GM Service carries sufficient quantity of parts to handle any replacements that may be required.



With the rebuilding of the barge *Barge GM Service*, greater warehouse and working space are provided so that several boats may be simultaneously serviced. The barge is 247 feet long and 45 feet wide and not only has office space for service but also parts warehouse and repair shop. Sufficient quantity of parts are warehoused to handle any replacements which might be required. To round out the service to operators while the boat is tied up, other facilities such as fresh city water, both ac. and dc. power in the event that all auxiliary engines are to be secured during overhaul, is available. In addition to the service facilities on the barge, Cleveland Diesel has offices of the area sales representative. Clarence Cromwell is the sales representative serving the Mississippi and Ohio River systems.

On July 7, 1953, the first towboat tied up to the barge; it was the *Midwest Cities*, owned and operated by the Lake Tankers Corporation. Along with the *Midwest Cities* the towboat *E. B. Ingram*, owned by the Ingram Products Company, and the *Gene C. Hutchinson* of the Hutchinson Barge Line were serviced at the same time.



One of the standby emergency electric power units provides lighting on the grounds of the Detroit Transmission Division after its recent fire. It is a truck mounted GM Detroit Diesel generating set.

A CIVIL DEFENSE APPLICATION

At a railroad siding and other points the emergency generating sets provide light for around the clock clean-up operations.



EMERGENCY POWER SPEEDS SALVAGING OPERATIONS

AN outstanding demonstration of the usefulness to industry of emergency standby electric power occurred in August when General Motors' Detroit Transmission Division plant near Detroit, Michigan was completely destroyed by fire.

As the plant manufactured hydramatic transmissions for General Motors and other automobile companies it was imperative that the manufacture of these vital units be resumed as quickly as possible. This involved the immediate starting of salvaging operations to determine which machines damaged in the fire, if any, might be rebuilt and put back into operation at another location.

Hundreds of these machines were moved out into the Division's extensive employee parking grounds as soon as workmen could enter what was left of the plant. But at the end of the first day, when darkness set in, practically all salvaging operations necessarily came to a standstill. Mainline power had already been made available but it was considered too dangerous to run current through under-pavement feed lines from the fire area until these lines could be examined and checked for damage. Standby electric power units mobile enough to be set up at any point desired was the answer to the problem. Such units were available and because no stringing of temporary wiring was required the grounds were ablaze with light on the following night. For the next twelve nights it was possible for salvaging operations to proceed without interruption under dieselized emergency lighting facilities.

Standby electric power was supplied by a 100-kw. GM diesel truck-mounted standby generator set. The unit was hooked up to the control panel of the parking lot lighting system. Three other base-mounted diesel standby units manufactured by the Detroit Diesel Engine Division were also used at the stricken plant to take care of lighting at a railroad siding inside the plant gates and at other critical points removed from the general parking area.

Through the use of these units, the Detroit Transmission Division gained valuable time in its effort to get back into production and Detroit Diesel had another opportunity to demonstrate the value of standby power under actual emergency conditions.

*Could you make this report about
your diesel engine?**

CITY OF BESSEMER, MICHIGAN REPORTS:

PISTONS PULLED AT 24,600 HOURS!

- All rings were free
- No carbon in ring grooves
- All original rings replaced in original grooves
- Rings should last at least 10,000 more hours
- Maximum cylinder wear was .004 at top, .002 at bottom

OIL CHANGE AT 5000 HOURS!

- No oil added to crankcase between changes
- Power cylinders fed at rate of 2 drops per minute
- Main bearing, rod bearings show very little wear
- Average K.W. per gallon of fuel is 13.5 @ 60% load factor



Nordberg Diesel engine used by Bessemer,
Michigan Municipal Power Plant.

EXCELLENT

Sam Galamber

Superintendent,
Bessemer Light Utility.

Note:

FOR TOP ENGINE EFFICIENCY,
BESSEMER RELIES ON:

Cities Service DC-930 Oil used for crank-
case lubrication!

Cities Service DC-230 Oil used for power
cylinder lubrication!

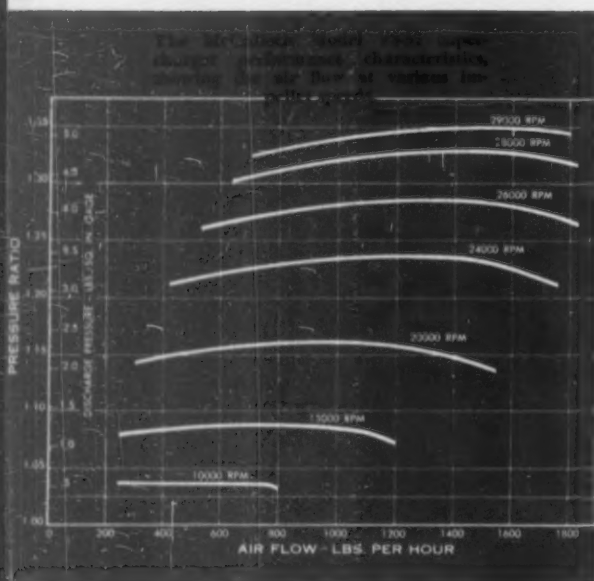
* Why not contact your nearest Cities Serv-
ice Representative or write Cities Service
Oil Company, Dept. K8, Sixty Wall Tower,
New York City 5, New York.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS



A CENTRIFUGAL SUPERCHARGER FOR SMALL DIESELS

By SIDNEY HOFFMAN



THE need for more power has generally meant larger engines. And, where too large an engine became uneconomical for various reasons, two smaller engines have generally been applied. This fact is particularly true in the case of heavy, off-highway automotive equipment. With the sprinting increase in the use of diesels in such fields as roadbuilding, strip mining and construction, there is a constant demand for more power in the limited space under the hood.

On large stationary, marine and railroad applications the cry for more power has been answered by the use of a turbocharger. This has not been generally the case with trucks and buses. The reason is that a turbocharger for these smaller engines has definite limitations as to size. It must provide the additional performance without too large an increase in weight or bulk.

The specifications for a small supercharger are

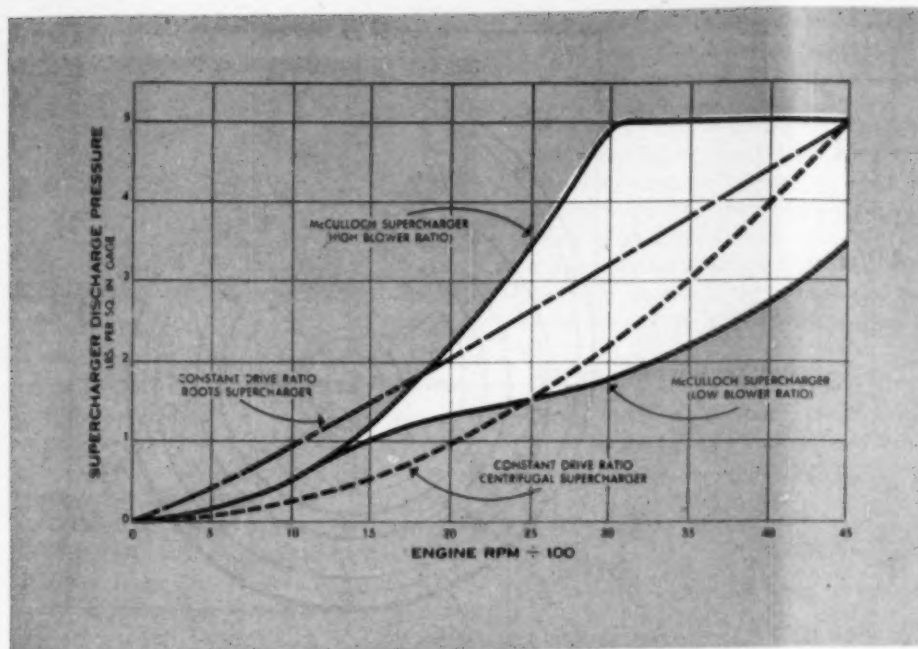
A Message to The Diesel Industry From Robert P. McCulloch

President, McCulloch Motors Corp.,
Los Angeles 45, California

We have invested three years and \$700,000 developing and tooling a new supercharger design, in the belief that the diesel industry, among others, will welcome substantial percentage reductions in cost and horsepower.

All our tests to date convince us that the time and money was well spent and that we have a supercharger that can greatly reduce cost, weight and bulk problems in both mobile and stationary diesel applications.

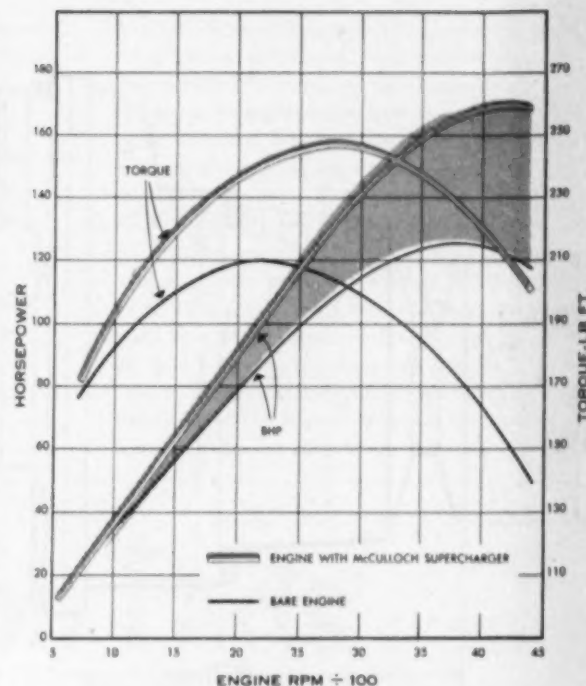
We are planning to introduce the new McCulloch variable-speed centrifugal supercharger to the diesel industry at the SAE National Diesel Meeting in Chicago, November 3 and 4. We will have an exhibit of our automotive model VS-57 supercharger, together with an even newer heavy-duty model designed specifically for diesel engines up to 250 horsepower. All diesel engineers attending the meeting are invited to visit our display room.



The performance of the McCulloch supercharger in high and low ratios through engine speed range compared to other supercharger types.

rigid and must be adhered to if it is to find ready acceptance. The original cost of the supercharger must be low. It must be able to deliver significant pressure boost at low engine speeds without developing excessive impeller rpm. It should have an independent lubrication system not requiring a check too often. Noise must be imperceptible during its entire life and it should have a service life equal to that of the engine. Ideally, this supercharger should be adaptable to a wide range of engine sizes in order to avoid the need to stock many different size units.

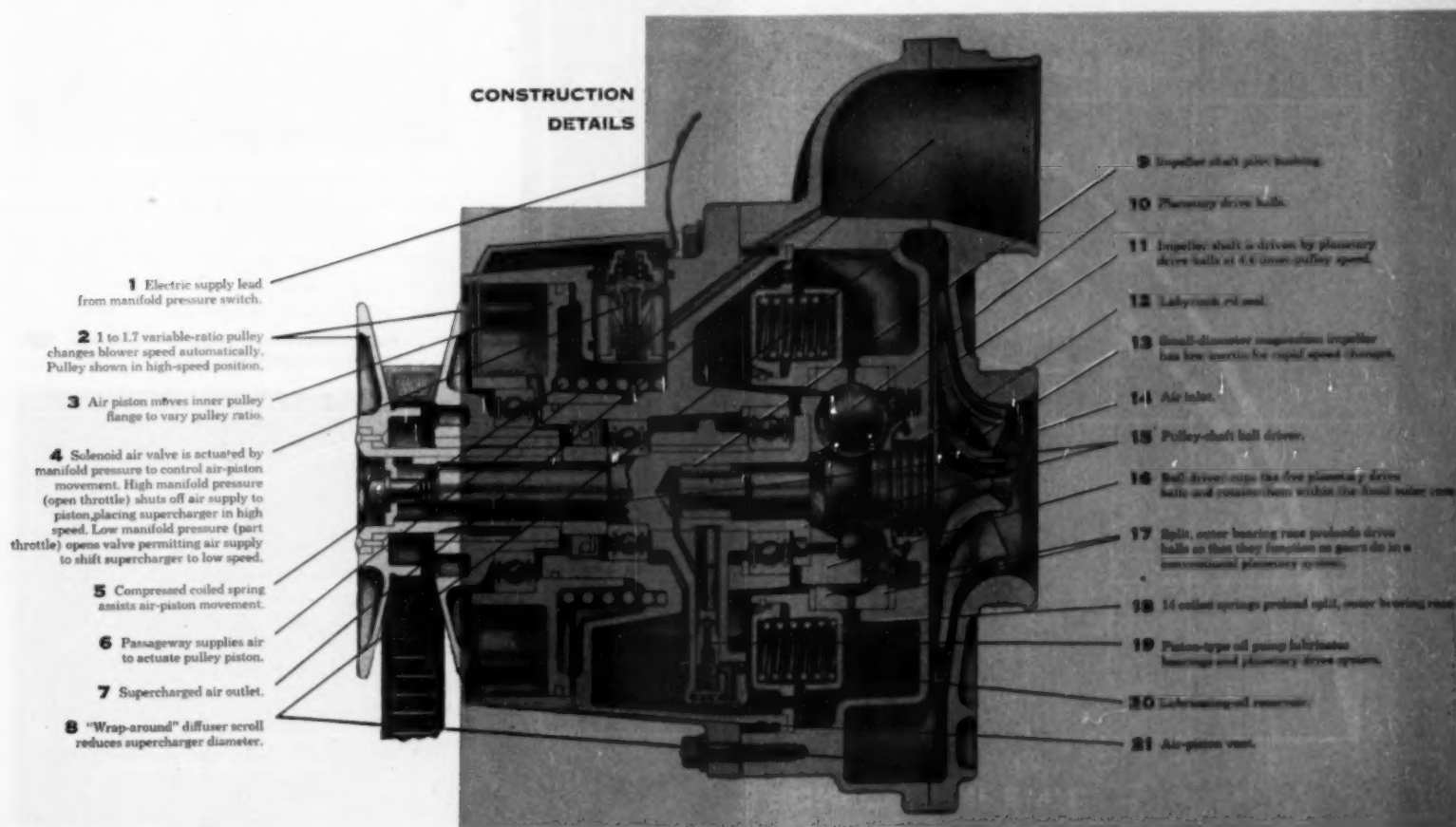
McCulloch Motors Corporation has been testing a variable-speed centrifugal supercharger which, it is claimed, meets these requirements. It is a compact unit of simple design without gearing or close tolerance machined surfaces. Its principal components are high-pressure die-castings which can be mass produced with great strength and precision. Assembly and installation do not present any complex problems. To provide noiseless operation, a new type of drive is incorporated in it. It steps up impeller speed to 4.4 times the pulley speed. This simple device is comparable to a planetary-gear speed

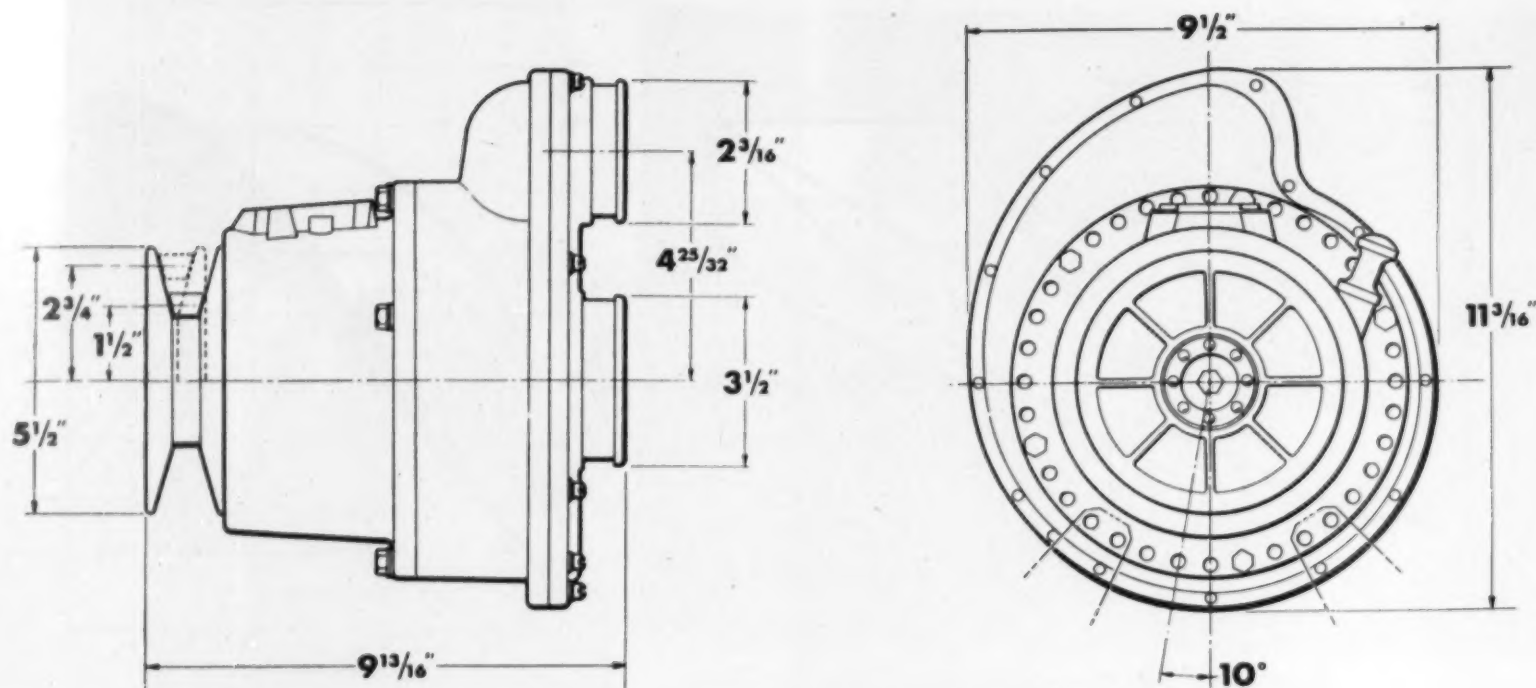


Torque and horsepower curves of a typical 8-cylinder engine with and without the VS-57 supercharger.

increaser except that spring loaded balls replace the planet gears. Since the pre-loading of the drive balls takes up any wear, the ball-bearing planetary drive remains silent in operation throughout its life. An independent pressure-lubrication system, including reservoir is provided. There are no grease fittings, oil wicks or crankcase connections. As long as the oil level indicator shows adequate oil, the supercharger is properly lubricated.

The unit has a manifold-pressure-controlled, variable-speed drive with a governing device which





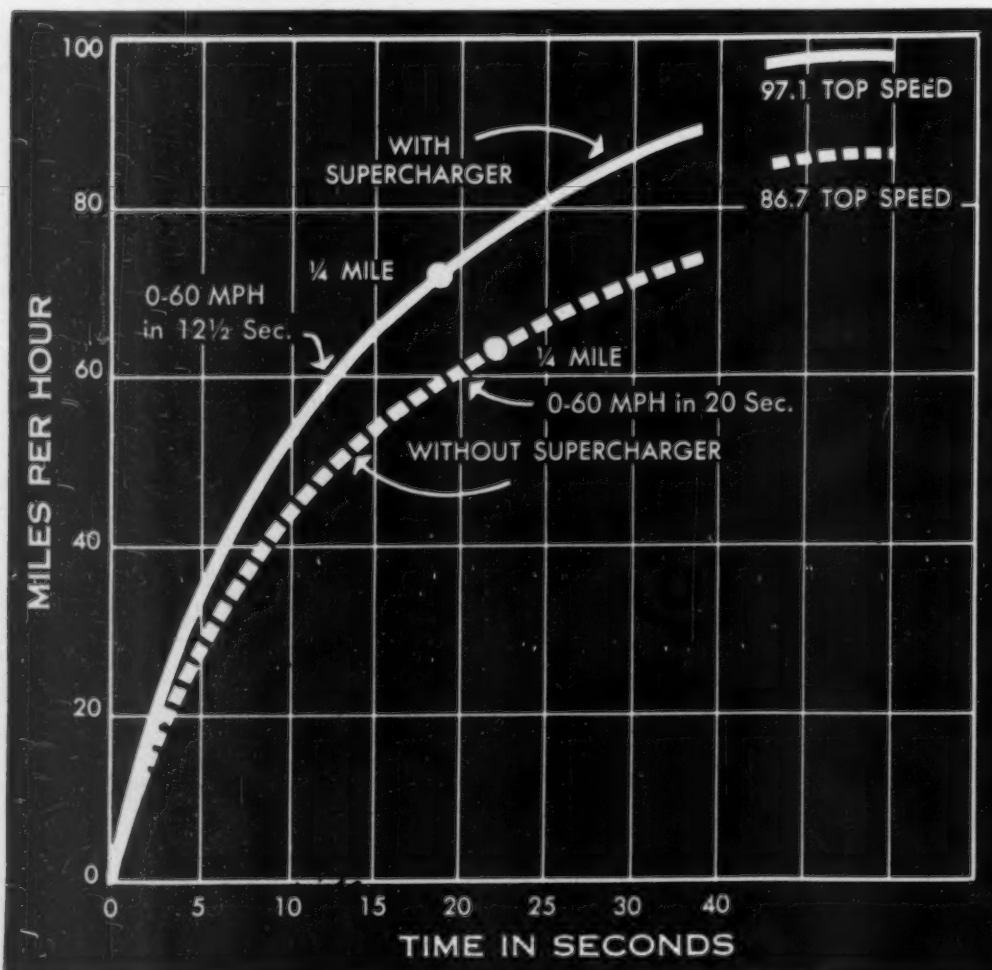
The dimensions of the McCulloch Model VS-57 variable-speed supercharger.

limits the pressure boost to 5 psi. This allows the supercharger to shift automatically between the high and low ratios as required by operating conditions. Thus, the supercharger idles (in low ratio) unless called upon to increase the engine performance. At low engine and vehicle speeds, the unit delivers significant pressure boost for accel-

eration when in high ratio. At high engine and vehicle speeds, the governing device shifts the supercharger to low ratio to maintain safe impeller speeds and pressure boost.

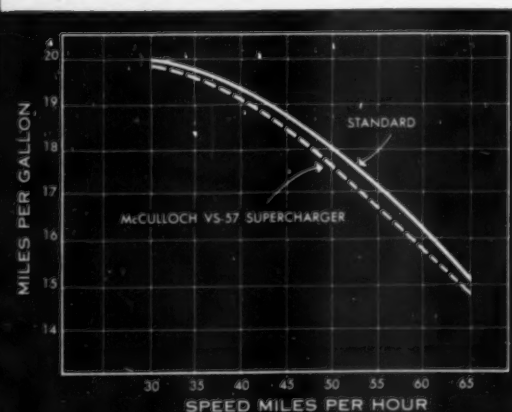
The McCulloch supercharger unit, Model VS-57, has seen practical service on a popular automobile.

It has a weight of 23 lb. 14 oz. Its designed operating pressure is 5 psi 1400 lb./hr., 29,000 rpm. It has a height of 11 3/16 in., a width of 9 1/2 in., and a length of 9 13/16 in. The performance curves shown in this article are the result of tests made on a stock car. Figures on the diesel model were not available at this time, but should be at least comparable.



Acceleration and top speed curves of the test car equipped with dual exhausts, with and without the VS-57 supercharger.

Fuel economy curves with and without the VS-57 supercharger on the test car



Northern Lumber Outpost



A portable 8-foot sawmill operated by the Chukuni Lumber Company turns out over a thousand board feet of lumber every hour in a remote area near Snake Falls, Ontario. The sawmill, including live-log skids, head saw, four saw trimmers, bull edger, and a sawdust-exhauster, gets its power from an International UD-16 diesel engine. The portable arrangement was devised by Hugh McCallum, vice-president and general manager of Chukuni, which owns five International power units besides the UD-16, as well as four International crawler tractors.

The UD-16, purchased in August, 1952, uses 30 gallons of diesel fuel per 9-hour day. Oil changes on this unit occur after every 200 hours of operation. Daylight shortness in this northern outpost requires the use of a Ready Power Generator, powered by an International UD-6 diesel engine to light the work area and supply power for the two-way radio system which keeps the Chukuni project in touch with the outside world.

The "Briny Marlin"



Built on the banks of the San Sebastian River in St. Augustine, Fla., the *Briny Marlin* is an attractive and well built 73 foot shrimp trawler of a new design by H. W. Hutson and might well change the overall picture of the "Florida Type" shrimp trawler used in Gulf fishing. Built for the Beerbower Shrimping Industries of Jacksonville, by Modern Trawlers Inc. of St. Augustine, the *Briny Marlin* is the first of several being built and launched from this new shipyard.

The ever increasing demand for larger and sturdier constructed trawlers for the Gulf of Mexico shrimp banks, was one of the reasons Jacksonville Yacht Storage Co. decided to enter the "package unit" trawler field. For powering this new trawler, Mr. L. F. Beerbower selected a 6 cylinder Murphy diesel of 190 hp. at 1200 rpm. The engine is also equipped with a Snow Nabstedt clutch and 3:1 reduction gears plus a Twin Disc power take-off. The engine which turns a 48x42 Columbian propeller through Goodrich Cutless bearings, gives this new type trawler excellent speed and maneuverability, two essential features required for the broad shrimping operations of today. The engine room

also contains a 4 hp. Crofton diesel light plant with a 900 watt Delco Remy generator plus a Westinghouse air compressor.

The *Briny Marlin* was designed to offer greater stability on long voyages. One outstanding feature is the elimination of deadwater through a boxed keel arrangement. The Murphy diesel engine is in the stern which means a short shaft, the heavy duty rudder has been made hollow for buoyancy. The hull and cabin bears the mark of solid marine construction and the skill of highly trained craftsmen.

Barge Generating Sets

Being tested at the Union Diesel plant in Oakland are the first of a group of generating sets for

new 100 ton derrick barges. The Union diesels develop 250-hp. at 600-rpm. Each is fitted with Bendix-Scintilla fuel injection equipment with inverted pumps arranged in the most accessible manner under camshaft housing. Woodward UG8 governors are drive driven direct from flywheel end of crankshaft. Built-in fresh water cooling systems center around Union tube and shell heat exchangers with thermostatic and manual temperature regulation; oil can be cooled as much or little as desired; all lube oil being cooled instead of only a small portion subsequently mixed with uncooled oil. This Union arrangement cuts sludge and keeps heat exchangers and engines much cleaner. The Union diesels, Ideal generators, and fabricated sub-bases are mounted on Fabreeca vibration isolators.

Eaton Parts for Diesel Engines



have a background of years of cooperation with the Diesel industry

Eaton is proud to have served as supplier to leading Diesel engine manufacturers for many years—furnishing valves, free-valves, lash adjusters, valve seat inserts, cam followers, bolts, studs, and other precision

parts. This close cooperation with the Diesel industry has given Eaton engineers a thorough understanding of the requirements of specific engines, so essential in solving valve-train and other problems.

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

SAGINAW DIVISION: 9771 FRENCH ROAD • DETROIT 13, MICHIGAN



PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings • Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Appoints Vice President

R. J. Minshall, president of Pesco Products Division, Borg-Warner Corp., at Bedford, Ohio, announced the appointment of Paul W. Brannon as vice president of manufacturing. Mr. Brannon has been associated with Pesco Products since November 1952 and more recently in the capacity of manager of manufacturing. Prior to his joining the Pesco organization, Mr. Brannon had been the factory manager of Lennox Furnace Co., Lima, Ohio; works manager of the Wayne Pump Co., Fort Wayne, Ind.; works manager of the Borg-Warner Supercharger Co., Milwaukee, Wisc.; and superintendent at the Milwaukee works of International Harvester Co. Mr. Brannon's new responsibilities

will include all manufacturing and procurement of materials.

Young Catalog

A new 4-page, 2-color Catalog No. 353, featuring Young Heat Transfer Products for chemical, industrial and oil field applications has just been issued by the Young Radiator Company, Racine, Wisconsin, and Mattoon, Illinois. Young products included in this catalog are: engine jacket water coolers; "CC" combination cooling units; supercharger air intercoolers; evaporative coolers and condensers; "HC" and "VAD" coolers and condensers. Other Young units described are: shell and tube heat exchangers; heating and cooling coils; unit oil coolers

and steam condensers. Each Young unit listed is represented pictorially, and accompanied with descriptive product information. To obtain your copy of the new Young Catalog No. 353, write: Young Radiator Company, Racine, Wisconsin.

Number Two



The second of five similar GM Diesel-electric tugs, *Bumble-Bee*, was delivered to the New York, New Haven and Hartford Railroad from the Jakobson Shipyard at Oyster Bay, N. Y., on Thursday, August 30. Officials of the railroad, headed by Fred C. Dumaine, Jr., and of Cleveland Diesel Engine Division of General Motors, headed by Thomas E. Hughes, general manager, were on the run from Oyster Bay to the railroad dock at Jersey City, which was made in a little over three hours. The *Bumble-Bee* was constructed by the Jakobson Shipyard, designed by Tams, Inc., New York naval architects, and is powered by a 16-cylinder, 2-cycle General Motors Cleveland Diesel engine with Marquette governor, rated at 1590 horsepower at 750 revolutions per minute. It will be in service in New York Harbor, shuttling freight between the railroad terminals in New York and New Jersey.

Bumble-Bee was the pet name of the late Frederic C. Dumaine for his daughter Betty. Mr. Dumaine was chairman of the board and president of the New Haven Railroad. Building of these new tugs is being undertaken, railroad officials said, "to provide the best possible equipment for the vital job of linking New England's rail arteries with national rail systems terminating in New Jersey. The greater power, efficiency and dependability of the new tugs will help to insure rigid adherence to the railroad's new freight delivery schedules." In actual service the *Bumble-Bee* will be required to handle two car-floats at a time, each carrying as many as twenty freight cars, a total dead weight of more than 4,000 tons. The New Haven handles more than 40,000 cars monthly across New York Harbor to and from connecting lines, in addition to another 1,000 cars which are moved on scows, covered barges and hoist boats to and from ships in the harbor.

Buda Assets to Allis-Chalmers

Transfer of the assets of the Buda Company, Harvey, Ill., to Allis-Chalmers Manufacturing Co., West Allis, Wis., is expected to be completed around the end of October, it was announced recently by W. A. Roberts, Allis-Chalmers president. The time for dissenting shareholders of the Buda Company to demand payment for their shares expired September 30. The number of shares dissenting was so small that completion of the transaction pursuant to the plan of reorganization between the two companies is now assured, subject to various closing requirements of the plan.

IT GOES DOUBLE FOR Briggs

ON LAND . . . OR WATER BRIGGS
CLARIFIERS PROTECT BIG
EQUIPMENT INVESTMENTS

SEE THE "CHICAGO SOCONY" ARTICLE
IN THIS ISSUE

Again . . . 2 Briggs CD type clarifiers protect the lube lines on their huge marine diesels.

Briggs EQUIPPED FOR
MARINE
DIESELS

READ THE NARRAGANSETT STORY
IN THE DECEMBER ISSUE

There are 5 Briggs CD type clarifiers on the lube lines . . . of these giant stationary diesels.

Briggs EQUIPPED FOR
STATIONARY
DIESELS

AGAIN . . . AND AGAIN Briggs Clarifiers have been chosen because these compact units embody an oil storage compartment, full-flow strainer, and Briggs Disc-Pac, all cellulose filter cartridges.

ALL IN ONE EFFICIENT COMPACT TANK!

A N D

Because Briggs exclusive Disc-Pac, all cellulose filter cartridge gives

- HIGH FLOW RATE
- HIGH DIRT PICKUP
- LOW PRESSURE DROP



- FEWER CARTRIDGE CHANGES
- PEAK FILTRATION
- MODEST INITIAL COST



THEY STORE
THEY STRAIN
THEY FILTER

Briggs
PIONEERS IN MODERN
OIL FILTRATION

- Oil Clarifiers
 - Oil Filters and Cartridges
- FOR OVER A QUARTER OF A CENTURY . . . DESIGNING AND MANUFACTURING DEPENDABLE FILTRATION FOR
- MARINE • INDUSTRIAL AND RAILROAD USE

THE BRIGGS FILTRATION COMPANY, RIVER ROAD, WASHINGTON 16, D.C.

Flexonics Appointments



Thomas K. Wells



Howard W. Griesbach



Richard H. Sabel

Appointment of Thomas K. Wells as general sales manager of Flexonics Corporation, Maywood, Ill., has been announced by John F. P. Farrar, president. The company manufactures flexible metal hose, metallic bellows, expansion joints and aircraft components. Mr. Wells has

been with the company twelve years and was most recently sales manager for the Bellows and Aircraft Divisions. The post of general sales manager is newly created. Since the death in 1950 of A. S. Keller, who was vice-president in charge of sales, overall sales direction has been under a sales executive council.

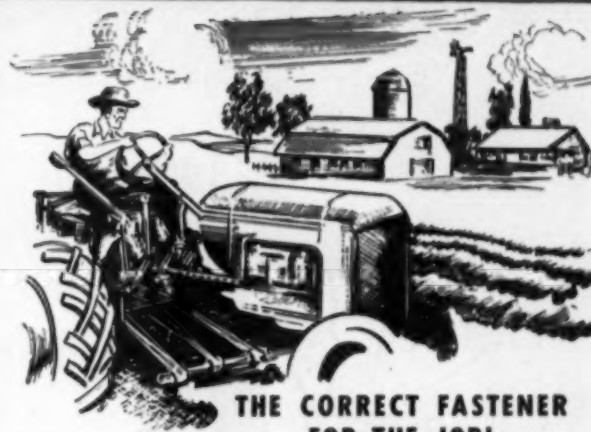
Mr. Farrar also announced appointment of Howard W. Griesbach as assistant sales manager, Bellows Division. Mr. Griesbach recently returned to Flexonics Corporation after eight years with Brown Instrument Division of Minneapolis-Honeywell Regulator Company, for which he served during the past three years as industrial manager at Milwaukee. Earlier, he was with Flexonics for five years. Richard H. Sabel, formerly general manager of Midwest Roof Deck Company, has been appointed to another new position, sales development manager, Mr. Farrar announced.

Plant Expansion

Steel erection for a building to house a new 300 foot, completely air-conditioned, high-speed assembly line is now in progress at Cummins Engine Company, Inc., Columbus, Indiana. The building will have three floors—the modern conveyORIZED assembly line will occupy the first floor, while the upper two will contain over 16,000 square feet of office space. This plant expansion, part of a \$7,000,000 program now under way at Cummins, is designed to increase production and plant efficiency. The new conveyor line for the final assembly of Cummins Diesels is located in a separate area; is air-conditioned by an 80-ton unit; and is completely dirt and dust proof. This innovation allows closer control of quality as well as improved working conditions. Plans call for completion of the structure by early winter.

YOUR COPY OF DIESEL ENGINE CATALOG in its eighteenth completely re-edited, revised and expanded edition is now off the press. An invaluable aid to design engineers and buyers, it incorporates the latest diesel engine specifications and descriptions. Order your copy of this latest edition now. Profusely illustrated. \$10.00. Mail checks to **DIESEL PROGRESS**, 816 North La Cienega Blvd., Los Angeles 46, California.

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THE CORRECT FASTENER FOR THE JOB!

Precision and Quality Workmanship, backed up by 38 years of Erie experience, are yours for thoughtful buying. Whether you require a fastener made from carbon, alloy or stainless steels, to special design, to exacting specifications, Erie fasteners will save you time and expense . . . from your planning, to procurement, to fabrication. Submit your fastener requirements to us, Erie Service will meet the challenge.

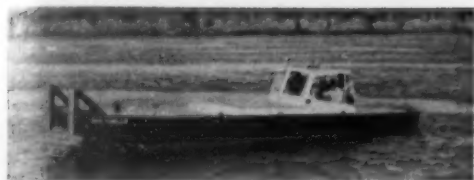


ERIE BOLT and NUT CO.
ERIE • PENNSYLVANIA

STUDS • BOLTS • NUTS
ALLOYS • STAINLESS
CARBON • BRONZE

Representatives in Principal Cities.

Utility Boat



The McWilliams Dredging Overseas Corporation was looking for a special built steel diesel dredge tender in a hurry. Equitable Equipment Co. Inc., of New Orleans, filled the order in short time. Equitable did not have to sacrifice quality for the sake of time. The designs were begun March 16 and completed by David P. Levy of Equitable and

approved by McWilliams Dredging Corporation by April 3rd. This is really short order when you consider that this is a special built boat having specific specifications. The keel was laid on April 4th, and on April 26th, (or about 18 working days later) the boat was delivered. A record of speed and quality. Equitable delivered a neat package of speed, safety, comfort, ruggedness, low maintenance, seaworthiness and versatility.

The *San Carlos* has an overall length of 35 ft. 7 in., a beam of 10 ft. 9 in., draft of 31 ft., and the depth amid is 4 ft. It is powered by two General Motors 6:71 diesel engines, 2:1 reduction, having a maximum of 400 hp. and 330 hp. continuous. Its pushing thrust, restrained is 7500 plus pounds and it

has a fuel capacity of 200 gallons. One of its outstanding maintenance features is the accessibility of the engines. The both engines can be completely removed in a matter of minutes.

The *San Carlos* is being used by the McWilliams Corporation to push dredges and pontoons, land tools, to transfer supplies, and dredge crews. Its base of operation is Lake Maracaibo, Venezuela. The pushing knees are steel with white oak insets and a natural finish. This better enables them to cope with the weather conditions that are readily associated with Lake Maracaibo.

Besides the many special features, the *San Carlos* also exhibits many of the features which are found in all "Equity" boats. It has safety glass windshields with electric wipers and a mahogany control stand. The entire vessel is sandblasted and the engine compartment is insulated with Insulmatic. All the lights are cast bronze, water tight, and chrome plated. The horn and pilot house controlled searchlight, which gives off a one-half mile ray, are also chrome plated. The *San Carlos* features three water-tight compartments and will float with one of these compartments completely flooded. There is an independent bilge suction on each individual compartment and a 30 gpm. rotary bilge pump.



CP CONTROLLED PRESSURE

Pressure is something you have to control, whether it's built up on the outside of a deep-sea diving suit, on the inside of a teakettle, or in the bloodstream of an angry or excited person.

Pressure is also a problem when you pump oil through an engine.

Sometimes the oil is cold and sluggish. Other times it is hot and easy-flowing. You can't always wait for the oil to be at just the right temperature before you start the engine and need lubrication. You want the lubricant *now*, and

you want it clean and dependable. That's the job of your filter.

Most filters don't function properly until the oil has been warmed up. The oil gets by-passed instead of cleaned. But that is not the case when you use Winslow "CP"* (Controlled Pressure) Elements. An exclusive and patented method of constructing Winslow "CP"* Elements makes sure that either hot or cold oil passes through the element instead of the by-pass, insuring positive Full Flow Filtration.

WHY NOT GET FULL INFORMATION ABOUT WINSLOW "CP"* FILTRATION. SEND FOR THE NEW FREE BOOKLET THAT TELLS YOU ALL ABOUT IT!

WINSLOW FILTERS

* TRADEMARK

Winslow Engineering Company • 4069 Hollis St., Oakland 8, Calif.

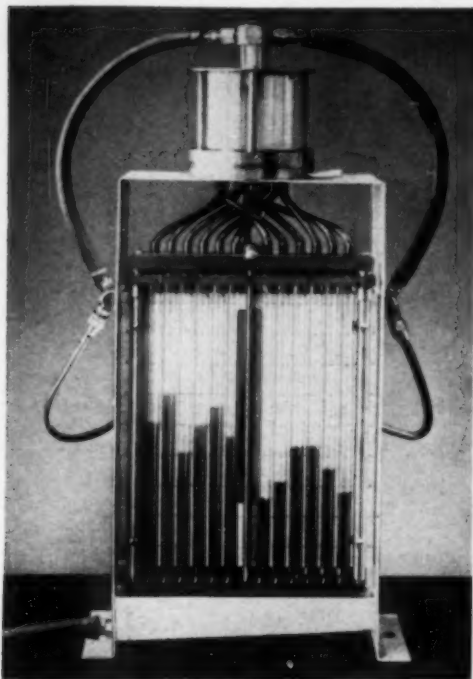
New Flexonics Plant

With completion last month of a 30,000 square foot addition to its Memphis, Tenn., plant, Flexonics Corporation transferred brass bellows production to Memphis from the pilot plant at Elgin, Ill. John F. P. Farrar, president, has announced. Output of brass bellows, widely used in valve seals and various types of thermostatic and pressure controls, will be stepped up six times, Mr. Farrar said. The move climaxes seven years of research and development of the product, involving an expenditure in excess of \$2,000,000. Flexonics Corporation, formerly known as Chicago Metal Hose Corp., also makes flexible metal hose, expansion joints and aircraft components. It pioneered the development of stainless steel bellows before adding the more common brass variety to its lines.

The new plant addition at Memphis is a one-story brick structure of modern architecture. It was built for Flexonics by Union Realty Company at a cost of about \$300,000 and will be rented on a long-term lease. Cost of equipment going into the building will exceed \$500,000. With the expansion, total value of plant and equipment at Memphis will be more than \$2,000,000. Flexonics Corporation's first building at Memphis was erected two years ago to manufacture aircraft components. Besides it and the Elgin plant, the company has three other plants in Illinois, one in Canada and an assembly warehouse in New Jersey.

Norman Dawson, who has been quality control manager at Elgin, becomes superintendent of the Brass Bellows Division at Memphis. Frank Brence continues as Memphis factory manager. About 125 new employees will be added to the Memphis work force. Those employed on brass bellows work at Elgin will be put on other operations there, Mr. Farrar explained. The expansion move will give the Elgin plant and laboratories greater freedom to develop other new products, he said.

Measures Nozzle Spray Dispersion



A new, portable device for fast, low-cost measuring of nozzle spray dispersion in jet and diesel engines for aircraft, trucks and buses, liquid fuel burners, and other mechanical atomizing equipment has been developed by Jet-Heet, Inc., according to an announcement by Calvin D. MacCracken, president. For the nozzle user, the device provides immediate facilities for time and labor saving pre-installation tests to insure proper atomization. For the nozzle designer and manufacturer, it permits accurate low cost development and production tests. Called the Patternator, the device is easily portable, weighs 25 lbs., and measures 10 by 6 by 20 inches in height. It requires no electric current and no installation. It operates by automatically collecting and measuring the flow in each segment of the atomized spray to determine the dispersion pattern as well as the total flow. It is adaptable to nozzles of varying sizes and types. In addition to fuel oil nozzles, atomizers for spray fluids such as water, chemicals and insecticides may also be tested.

For more complete details, write DIESEL PROGRESS, File 110, P.O. Box 8458, Cole Station, Los Angeles 46, California.

Record Load

A tow of 15 barges, loaded with 6,328,986 gallons of refined petroleum products, has established a new record for the *Esso Tennessee*, towboat of the Inland Waterways Department of the Esso Standard Oil Co. The barges, with their load of 22,560 short tons, were towed from Baton Rouge to New Orleans with Capt. N. G. Storey in command. In service since 1948, the *Esso Tennessee* is 166 feet long, has a 36-foot beam, and draws 7½ feet. She is powered by two 1,000 horsepower Superior diesel engines, made by The National Supply Co. Kort nozzles give added push power. The *Esso Tennessee* and a sister ship, the *Esso Louisiana*, were built by the Dravo Corp., Pittsburgh.

NOVEMBER 1953

Sound Engineering

by

**BURGESS-MANNING
COMPANY**

... wherever the flow of AIR, STEAM, and other GASES create N-O-I-S-E.

Standard Snubber* designs are available, incorporating Air Cleaning, Spark Arresting, Water Separation, Waste Heat Recovery, and Surge Control Features.

You can depend upon Burgess-Manning Engineers for a quality product... and SOUND ENGINEERING counsel to solve your noise problems.

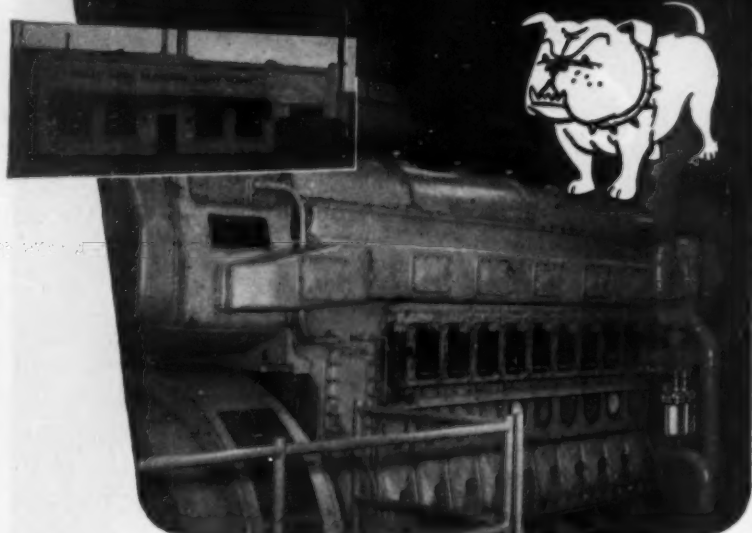
Burgess-Manning Snubbers installed at Corpus Christi, Texas, pumping station.



Chicago 749-A East Park Avenue, LIBERTYVILLE, ILLINOIS

Dallas

This NUGENT FILTER is a Fuel Oil Watch Dog



PROTECTED BY NUGENT pilot fuel oil filtering, the Fairbanks-Morse 1600 H.P. dual-fuel engine illustrated is establishing a "record" for dependable, economical service at the Wells, Minnesota Power Plant. Formerly a straight diesel, this opposed piston engine was converted to dual-fuel operation in 1951 and in the next eleven months \$19,000 was shaved off the fuel bill. This unit is one of the first Fairbanks-Morse opposed-piston engines ever to be converted to dual fuel operation.

By keeping the vital pilot fuel oil free from dangerous foreign material, the Nugent No. 1R Duplex fuel oil filter is a direct aid in the efficient operation of this engine. By actual test on other engines, Nugent filters remove particles as small as a few microns that otherwise might block the fuel injector or accelerate wear and tear on the engine.

Wherever engines must give long, dependable service, Nugent filtering provides the type of protection that is essential. That's why Nugent filters are factory installed in so many leading diesel engines.

Offering more effective filtering at lower cost, Nugent filters are available in a complete range of sizes and types to meet every need. They utilize inexpensive bag type cartridges having 20 times the filtering area of other filters of comparable size. And remember, Nugent filtering means 99.8% clean oil. Write for descriptive bulletin. Send an outline of your filtering requirements for specific recommendations.



Nugent No. 1R Duplex
Fuel Oil Filter



Wm. W. Nugent & Co., Inc.
415 N. Hermitage Ave. CHICAGO 22, ILLINOIS

WE FILTER, OIL, AND FUEL OIL. We also supply OILING DEVICES, RIGHT FEED VALVES, FLOW INDICATORS.

Representatives in Canada: Canadian Diesel & Engine Co. Ltd., 100 King St. W., Toronto, Ont. In England: The Diesel Engine Co. Ltd., 100, The Strand, London, W.C.2, England. In Australia: The Diesel Engine Co. Pty. Ltd., 100, The Strand, Sydney, N.S.W., Australia. In New Zealand: The Diesel Engine Co. Pty. Ltd., 100, The Strand, Auckland, N.Z.

Annual Meeting Special Diesel Program

At the coming annual meeting of the A.S.M.E. in New York, there will be a very important panel discussion on diesel fuel oil purification. This diesel meeting will be held on Tuesday, December 1st, at 9:30 a.m.

Wade Seniff of the Baltimore & Ohio will be chairman and John A. Worthington, representing the OGP will act as co-chairman. The Committee has extended invitations to the following to become members of the panel: F. L. Townsend, Wm. W. Nugent Company, representing the filter industry; C. M. Landis, De Laval Separator Company, representing centrifuging; Tom Moore, Village of Lowell, Mich., representing the power plant operators; and C. W. Hoffman, Socony-Vacuum Co., representing the oil industry.

The "Catherine-Tek"



Powered by two 320-hp. diesel engines, the 128-ft. Catherine-Tek makes the fastest run of all excursion boats between Hyannis, Mass., and Nantucket Island. It makes the 26-mile run in the average time of one hour and fifty minutes, for its operator, Nantucket Express Lines. Although the vessel is new on this run, it has given 24 years of service. The present Superior engines were supplied in 1941 to the U. S. Department of Commerce, Bureau of Marine Inspection and Navigation by the Engine Division of The National Supply Company.

Originally built as the Yacht *Waleda II*, it became the *U S S Tyrer* in government service which later included operation by the War Department, U. S. Engineer Office in Buffalo. The vessel was purchased by J. T. Gelinas for his Rhode Island Steamship Company, who owns Nantucket Express Lines, in 1952. It is of steel construction, 128 ft. x 20 ft. x 6 ft., and after refitting carries 188 passengers and a crew of six. The two engines are direct reversing Model 40 Superiors with 8 cylinders, 8 1/2 in. stroke and 10 1/2 in. bore, rated at 320 hp. at 720 rpm. They drive 40 x 38 3-blade propellers.



DIESEL PROGRESS

Licensing Agreement

Through a licensing agreement reached between American Bosch Corporation of Springfield, Massachusetts, U.S.A. and Simms Motors Units, Ltd. of London, England, the latter company has been granted the British manufacturing rights for certain American Bosch diesel fuel injection equipment. Under the terms of the agreement Simms is permitted to produce all new types and sizes of injection pumps and nozzles in the broad diesel line of the American firm. It is said however that a small injection pump of the distributor type is the principal product currently being considered for manufacture in England.

The distributor-type injection pump was designed and developed several years ago by American Bosch to provide a lower cost, lighter weight, simplified injection system for diesel engines. The introduction of this pump has contributed importantly to the development of small diesel engines for farm machinery and other uses. The agreement between the two companies calls for the exchange of technical information and know-how, and this feature is also expected to be of mutual benefit to both concerns.

Fork Lift Trucks



The Buda Company of Harvey, Illinois announces the development of two new 6000 pound capacity, pneumatic tired Fork Lift Trucks, models FTP-

60-24 and FTPD60-24. These new trucks available with dual or single drive wheels, have a load capacity of 6000 pounds at a 24 in. load center and are available in all standard lift heights of 72 in., 84 in., 108 in., 114 in. and 120 in. Model FTP60-24 is powered by a dependable heavy-duty Buda 6B-230 gasoline engine. A precision-built Buda diesel, model 6BD-230 powers the FTPD60-24. These modernly styled and engineered 6000 pound trucks are designed for long life and easy accessibility to all parts. They feature: a single lever, automotive type, full range gear shift; center-point steering; full front vision instrument panel; a 12 in. diameter industrial type, quick-change clutch; hydraulic brakes; all roller rolled-steel mast; self-aligning lift cylinder and a carriage mounted on quick adjustable side thrust, anti-friction rollers to reduce wear and eliminate excessive play in the carriage.

The overall length, less forks, is 104¾ in. for the dual drive trucks and 106¼ in. for the single drive trucks. Turns in intersecting aisle: 91 in. for duals, 86¼ in. for single front tired trucks. All models are available with torque converters (optional equipment) to eliminate shock to engine and transmissions and to provide smooth power.

Railroad Diesel Locomotives Increase

American railroads have placed into operation 1,565 new locomotive units in the first eight months of this year. Of those placed in service 1,550 were diesel-electrics, eleven steam, and four gas turbine.

Nordberg Supairthermal Bulletin

Publication of a new eight-page, two-color bulletin containing construction and operating data on Nordberg four-cycle Supairthermal V-Type stationary or marine engines is announced by Nordberg Manufacturing Company, Milwaukee 1, Wisconsin. Nordberg 13 in. bore and 16½ in. stroke Supairthermal V-Type engines as described in Bulletin 197 are built to meet the increasing demand for a high power, heavy duty diesel, dual-fuel or spark-fired gas engine of moderate weight and small dimensions. Specifications present the weight and ratings of both the 12 and 16 cylinder engines which cover a horsepower range from 2400 to 4260 at 450 to 600 rpm. Bulletin 197 illustrates and de-

scribes the construction features of Nordberg V-Type engines and also gives information on the pressure lubricating system and fuel systems for oil and/or gas operation. A schematic cross section shows the design and compact arrangements of the engine and all principal parts are identified. Dimensional line drawings for stationary and marine engine types are also presented. Bulletin 197 is available, free upon request to the company.

YOUR COPY OF DIESEL ENGINE CATALOG in its eighteenth completely re-edited, revised and expanded edition is now off the press. An invaluable aid to design engineers and buyers, it incorporates the latest diesel engine specifications and descriptions. Order your copy of this latest edition now. Profusely illustrated. \$10.00. Mail checks to DIESEL PROGRESS, 816 North La Cienega Blvd., Los Angeles 46, California.

How to buy more diesel for your money

Get the one that has the Lanova Combustion System

You'll get more "payload" power at less cost with a Lanova-type diesel. That's because the Lanova Combustion System—developed especially for modern high speed engines—is designed to get more work out of every ounce of fuel used. It does this by promoting peak combustion conditions in the cylinder and by timing and controlling the application of cylinder pressures to take full advantage of the piston's working thrust.

Chances are—the engine you're now considering has the Lanova Combustion System, because its outstanding advantages have led many leading diesel manufacturers to adopt this design. But, before you make any decision, it will pay you to . . .

Send for the Lanova handbook—This informative 58-page handbook has full details on the important role combustion plays in efficient low-cost Diesel performance. Write for it today.

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Dept. 3, 38-15 30th Street, Long Island City 1, N. Y.

One of America's foremost names in diesel research and development

Northern New Jersey Representatives

The Heat-X-Changer Co., Inc. of Brewster, N. Y., has announced the appointment of the General Hydraulics Co. of Newark, New Jersey as sales representatives in the Northern New Jersey territory. Heat-X industrial heat transfer products which they will handle include inner-fin oil coolers for hydraulically operated equipment, diesel engines, etc., and inner-finned water cooled aftercoolers for compressed air systems. Partners in General Hydraulics Co. are Mr. Eugene V. Barkow and Mr. John C. Swatsworth. For twelve years prior to entering the partnership Mr. Barkow was project engineer and experimental supervisor for Electrol, Inc. Mr. Swatsworth has covered the northern New Jersey

area as sales representative for hydraulic and pneumatic manufacturers for three and a half years.

Rock Island Diesel Shop

The Rock Island Lines has announced the opening of its newest and most modern diesel shop facilities, located at 47th and Wentworth Avenue, in Chicago. The \$1,000,000 installation is for maintenance and repair of diesel engines operating in and out of the Chicago area. It takes the place of a roundhouse which was built before the turn of the century. The roundhouse will be dismantled. The shop will accommodate 16 diesel units on its eight tracks. The tracks, elevated from the main floor, are over pits. The equipment also includes a

hydraulically operated table to remove or install engine trucks. Platforms at engine floor level make for easy access to upper sections of engines. Office space for the assistant master mechanic, road foreman of equipment, supervisors, office employees and the stores department is provided.

Cargo Ship "Prins Bernhard"



Built in Holland in 1938, the *Prins Bernhard*, a cargo vessel of 750 tons dead weight, was recently fitted with a Model 45-M5X-8 Atlas, 600 horsepower, 720 rpm., 8-cylinder, air-reversing diesel propulsion engine to give it an increase in cruising speed. Installation was made at the Todd Johnson Drydocks Corp., New Orleans, under the supervision of Arthur Duvic's Sons, Gulf Coast distributor for The National Supply Co., manufacturer of the engine. Mr. Fred Van Paradis, supervising engineer for the owners, recalls that one unusual feature of the installation was the lowering of the engine into the hull through the stack with only 1½ inches of clearance at the sides.



With the new engine, the vessel showed a trial run speed unloaded of 10½ knots, or an increase of 2½ knots over the former speed light. Loaded speed is expected to be 8½ knots. The *Prins Bernhard* is owned by the Surinam Navigation Co., Ltd., Paramaribo, Surinam, S. A., and plies between the coastal port areas of Dutch, French and British Guiana and Venezuela as well as the Dutch West Indies and other islands in the Caribbean. The Surinam Navigation Co., Ltd., also operates four other seagoing vessels of the same type, and twenty-four river craft on South American inland waters.

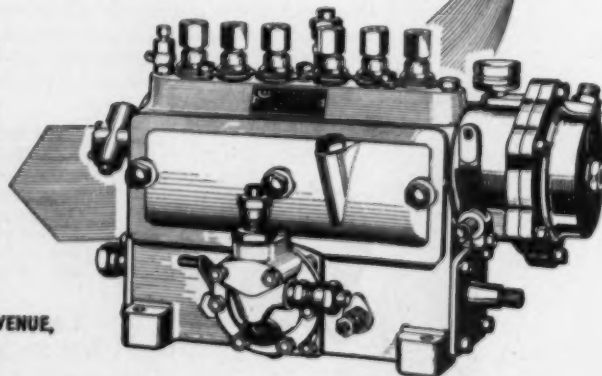


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The world's largest manufacturers of Fuel Injection Equipment for diesel engines

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Fuel Injection and Electrical Equipment

Gulf Coast Diesel News

By Michael T. Pate

LOWERY Brothers, Diboll, Texas, have purchased through Stewart & Stevenson Services, Inc., a General Motors Series 110, Model 62400 diesel turning up 275 hp., which they plan to use as prime drive on a sawmill in the Diboll area.

JEFFRIES Equipment Company, San Bernardino, California, has bought through Cummins Sales & Service, Houston, six Model NH-600 Cummins diesels. These 6-cylinder, 200-hp. engines will be used as replacement power units on the company's heavy-duty highway trucks.

HUMBLE Oil & Refining Company is having Platzer Motor Boat Works, likewise of Houston, install two General Motors diesels, each Series 51, and rated at 80 hp. each. These two diesels, models 43200-RA and 43200-LA will power counter-rotating screws in a crew boat being built for Gulf Coast operations.

TEXAS Construction Materials Company, Houston, has bought through Mustang Tractor & Equipment Company to re-power a Davenport-Bessler 45-ton standard gauge locomotive a Caterpillar Model D 386, rated 400 hp. at 1200 rpm., which will be direct-connected to a 900 rpm. Westinghouse model 181-L dc. generator. The unit is being used in the company's gravel pit operation near Eagle Lake, Texas.

ATLANTIC Refining Company, Houston, is having Platzer Boat Works, Houston, install a General Motors Series 71, model 6071-A diesel marine propulsion unit, secured through Stewart & Stevenson Services, Inc., of Houston, as driving unit on a crew boat which the company will use in Gulf Coast production work.

WHELESS Drilling Company, Shreveport, La., has purchased through Waukesha Sales & Service, Houston, one Model 6 NKDU Waukesha diesel developing 250 hp. at 1050 rpm., to be used as auxiliary mud pump drive on a new drilling barge being built for the company's marshland drilling operations.

THE Santa Fe Railroad, at its Somerville, Texas shops, has secured through Stewart & Stevenson Services, Inc., a Series 71, model 6082 torque-converter equipped General Motors diesel to repower a Plymouth 25-ton yard switching locomotive. The installation was performed by Stewart & Stevenson, Houston, on a turnkey basis.

SAMSCO Machine & Supply Company, San Antonio, Texas, has bought through Waukesha Sales & Service, Houston, a Model 190 DLCU Waukesha diesel, rated at 40 hp., to power a vertical irrigation turbine pump.

PATSO Company, Inc., Houston, has had Stewart & Stevenson Services, Inc., Houston, install a General Motors Series 71, Model 3031C, 75 hp. diesel on a special oilwell cementing truck to drive the high-pressure pumps and other auxiliary equipment not direct-connected to the truck power plant.

KERRVILLE Bus Company, Kerrville, Texas, has bought through Cummins Sales & Service, Houston, one Model JBS-600 150-hp. Cummins diesel to be used to replace gasoline engine power plant on one of its express busses.

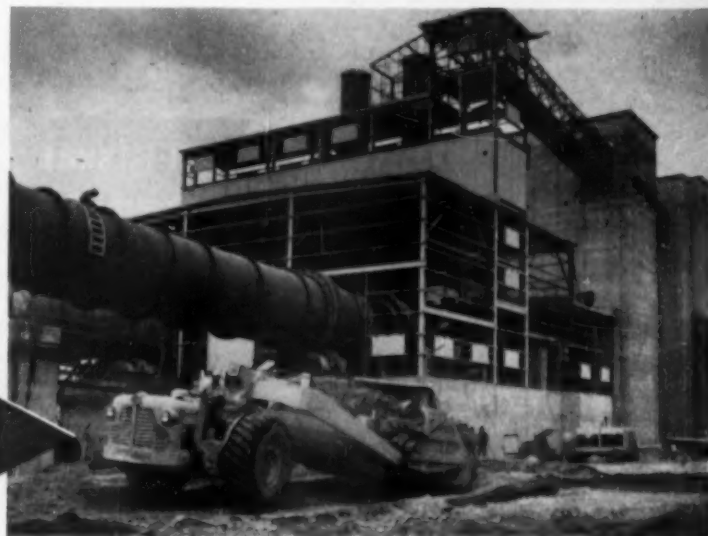
FREEPORT Sulphur Company, New Orleans, La., has bought from Stewart & Stevenson Services, Inc., three Stewart & Stevenson Model 2GD22 ac. generating sets, each powered by a General Motors Series 71, 2 cylinder diesel rated at 34 hp. at 1200 rpm. The generating sets will be used for lighting and stand-by power on a drilling barge.

DuVALL Potash & Sulphur Company, Carlsbad, New Mexico, has bought through Cummins Sales & Service, Houston, one Model 180 DLCU rated at

30 hp., which will power a Jeep for use in the company's underground mining operations.

McWILLIAMS Dredging Company, New Orleans, La., has installed a Stewart & Stevenson Model 2MD20 dc. generating set powered by a General Motors Series 71 2 cylinder diesel rated at 34 hp. The set will be used for powering auxiliary equipment on the company's new dredge.

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EXTRINOL... the D-X

GIANT DIFFERENCE
that cuts diesel maintenance costs!

Extrinol, the group of special additives in D-X DHD Motor Oil, helps reduce diesel maintenance costs two ways:

First, Extrinol means more hours or miles of service on every fill of D-X DHD. Extrinol increases the stability of D-X DHD, toughens the oil to better resist the extreme pressure, high heat, and severe operating conditions that thin lubricants out.

Second, Extrinol means longer engine life. Extrinol gives D-X DHD Motor Oil great cleansing power and resistance to acids, oxidants, and other contaminants. These are the agents of wear that lubrication alone cannot counteract. But D-X DHD with Extrinol protects your diesel's piston crowns, rings, bearings and valves against these wear-causing deposits.

Your engines need and deserve the protection of D-X DHD Motor Oil. We're so certain you'll agree, once you've tried it, that we guarantee D-X DHD unconditionally: You must be satisfied or we'll refund your money.

Today, if you live in the Midwest, contact your D-X salesman or write our office nearest you. Try D-X DHD with Extrinol. Make us prove D-X DHD can cut your maintenance costs.

D-X Diesel Motor Oils

MID-CONTINENT PETROLEUM CORPORATION
TULSA, OKLAHOMA Waterloo, Ia. Terre Haute, Ind.
Omaha, Nebr. Chicago, Ill. Minneapolis, Minn.

Golden Jubilee Show

Fifty years of growth from the naptha launch to sleek express cruisers and fifty years of expansion from a handful of wealthy owners to millions of recreational boating enthusiasts who fish, vacation and in other ways derive pleasure from their craft. That is what has happened to boating in half a century.

The National Motor Boat Show for 1954 will therefore have a Golden Jubilee theme. It will be held in New York City's Kingsbridge Armory January 15-23. H. A. Bruno & Associates, Inc., public relations counsel for the Show and its sponsor, The National Association of Engine and Boat Manu-

facturers for the past 27 years will be the source of information on the Show as in the past.

Nordberg Bulletin

Higher output and greater savings through new improvements of the Nordberg Type TS-21 diesel engines are discussed in the new two color bulletin 224A, recently published by Nordberg Manufacturing Company, Milwaukee 1, Wisconsin. Ranging in size from 2550 hp., 1800 kw. to 6150 hp., 4400 kw., the Nordberg Type TS-21 engines described in the bulletin are widely used in municipal power plants, central stations, and industrial power plants. Typical installation photographs illustrate these types of applications.

Of special interest to all stationary power users in the horsepower range of the Nordberg Type TS-21 diesel engines is the cross-sectional drawing through the power cylinder showing the special features and improvements in design which have been made to the engine. Bulletin 224A is available free upon request.

To Chicago Post



R. T. Oliver, Jr.

R. T. Oliver, Jr., of Dallas, has been assigned to the Chicago sales territory by Burgess-Manning Company's Dallas Division, it has been announced. The Dallas Division of the company serves the petroleum-chemical industries. Appointment of Mr. Oliver, who will assume his new duties in Chicago soon, was announced by S. G. Paddock, sales manager of the Dallas Division.

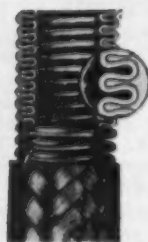
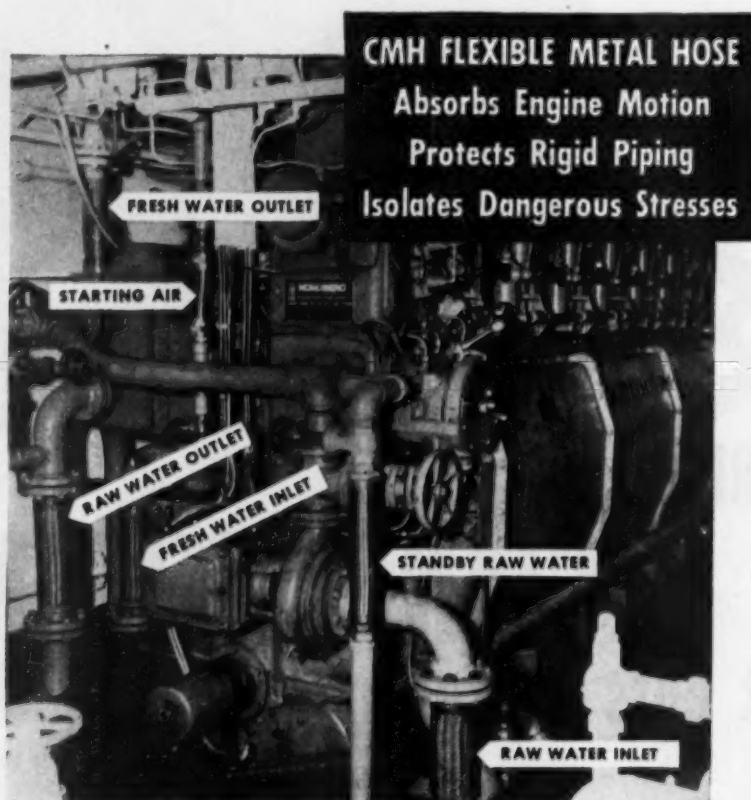
Names New Distributor

Announcement has been made by W. L. Fetherston, sales manager of A & D Diesel Service, Inc., of the appointment of A & D as authorized sales and service representatives on diesel fuel injection equipment by American Bosch Corporation. A & D are located in the Brooklyn, N. Y., area at 145 21st Street.

The "Joan-Ellis"



The Joan Ellis, most recently completed boat by Dalehite Boat Works, was christened recently at owner T. F. Ellis' private pier in Galveston. Approximately 300 invited guests witnessed the colorful ceremony during which Mrs. Hugh K. Jones christened the 40 foot launch named in honor of the owner's infant granddaughter. It was blessed by Father W. L. Tinney of Sacred Heart Church in Galveston. The new boat will take its place in service along with her three sister ships, Lu Ann, Linda Sue and Louise Ellis, now operating in the Galveston area. For power, all four boats rely on GM diesel engines, model 6-110, furnished by Stewart and Stevenson Services, Inc., one of the nation's largest distributors of GM diesel engines.



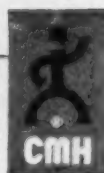
Vital piping connected to the Nordberg marine diesel shown above, is protected with CMH Flexible Metal Hose. The stresses of vibration, expansion and contraction, and misalignment are effectively absorbed by these flexible connections. In existing installations or new ones, it will pay you to eliminate these common causes of piping failure with CMH Flexible Metal Hose. Write for Bulletin 124.

CHICAGO METAL HOSE Division

Flexonics Corporation

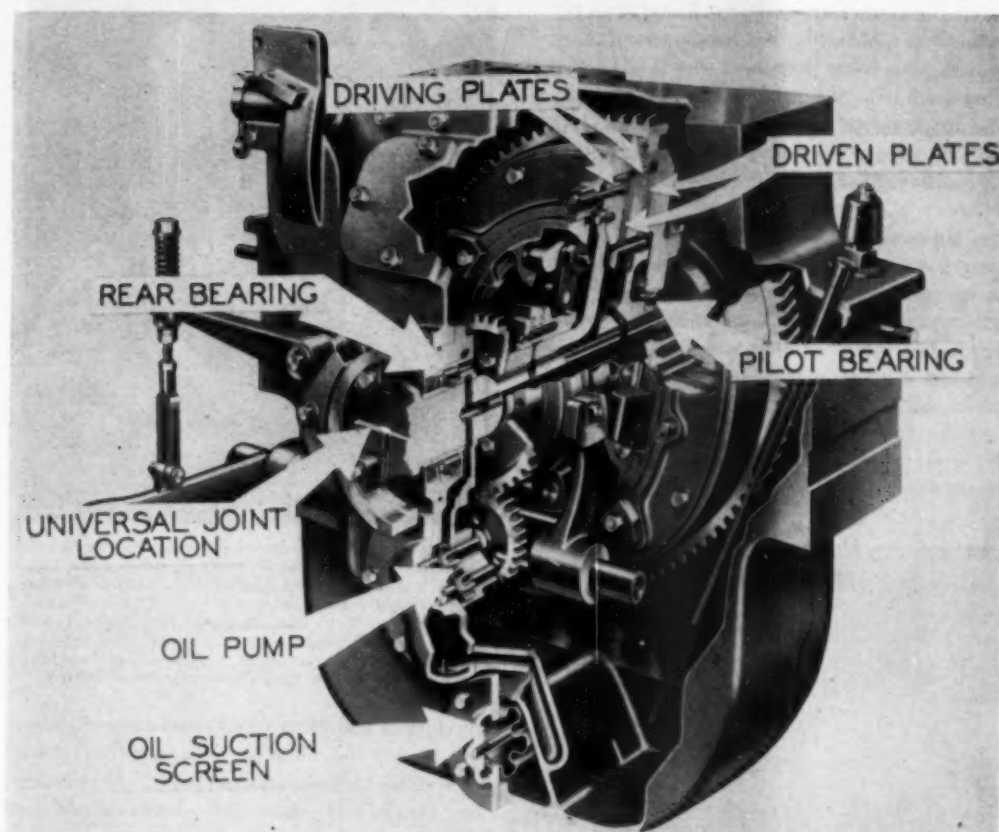
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Manufacturers of flexible metal hose and conduit, expansion joints, metallic bellows and assemblies of these components.
In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

Flexonics identifies
CMH products that
have earned industry
for over 35 years.



DIESEL PROGRESS

OIL TYPE FLYWHEEL CLUTCH



This titled cutaway shows the inner workings of the model of the new oil-type flywheel clutch which has been introduced as standard equipment on Caterpillar's D6 Tractor and No. 6 Shovel.

A major development, the oil-type flywheel clutch, has been introduced by Caterpillar Tractor Co. on four of its track-type machines. It is now standard equipment on the Cat D8, D7 and D6 Tractors and the Caterpillar No. 6 Shovel. This is the first successful oil-type clutch to be put into use in the crawler tractor field, and it will operate two to four times longer than an equivalent dry clutch before major adjustment or overhaul is necessary, according to the company. It is intended that under ordinary operating conditions the overhaul period of this clutch will coincide with the normal overhaul of the engine. Where the longer wear of this unit is particularly apparent is in the friction discs. When the clutch is being engaged, the oil absorbs the entire load up until the last few revolutions before full engagement at which time the friction faces finally come into direct contact with each other.

In the closed clutch housing the pump lifts the oil from the reservoir at the bottom of the housing and forces it through and around the clutch shaft in a continuous process. The oil is discharged around the inside diameter of the friction discs. It flows through the grooves and slots in the friction faces and pressure plates even when the clutch is engaged. The oil, ejected from the outside of the flywheel through radial slots, also provides constant lubrication for the cams, bearings and internal linkage. Clutches on heavy duty tractors such as these, generate exceedingly high temperatures.



only **HONAN-CRANE**

inside tip ... **DIESEL OIL PURIFIERS** give you so many vital **ENGINEERING FEATURES**

The Honan-Crane "Multi-Cartridge" Purifier is engineered, inside and out, to provide the high-flow, thorough oil purification essential for diesels. Removes all types of harmful contamination . . . substantially reduces engine wear and maintenance costs . . . quickly pays for itself in oil savings alone!

Here are a few of the time-tested features that make Honan-Crane preferred for safety and savings wherever diesels are used

- 1 Cartridges are readily interchangeable to provide type and degree of purification required.
- 2 Clean oil is drawn from top of purifier. Maximum efficiency of each cartridge is utilized.
- 3 Cartridge design prevents channeling or by-passing. Multiple units provide high flow rate.
- 4 Electric heater bands maintain correct oil temperature. Steam, hot water heating available.
- 5 Oil-and-gas-tight seals and gaskets prevent seepage. Dirty oil cannot contaminate clean oil.
- 6 Double-decked cartridges save floor space, permit clean design, greater operating efficiency.
- 7 Positive locks and pressure springs keep cartridges securely in place, prevent by-passing.
- 8 Purifier is fully equipped with automatic controls and safety features. Requires no attention.

INTERCHANGEABLE CARTRIDGES FOR HONAN-CRANE PURIFIER






TYPE "MC"—Cotton bag packed with Cranite (fuller's earth). Removes solids and products of oxidation... acids, gums, etc. Provides refinery-type purification.

TYPE "MP"—Perforated metal basket packed with Palconia (cellulose fiber). Recommended for additive oils for complete removal of dirt, scale and other solids.

TYPE "S"—Contains Palconia (cellulose fiber). Performs same as Type "MP." Fiber center-tube permits complete disposal of spent cartridge by burning.

TYPE "E"—Similar to Type "S" except that filtering material is cotton waste and excelsior. Type "E" is recommended when water is encountered in the oil.

WRITE US ABOUT YOUR OIL PURIFICATION PROBLEM

Honan-Crane Fuel and Lube Oil Purifiers are available for any size or make of Diesel Engine. For detailed information, write Honan-Crane giving make, model and H.P. of your diesel. Describe any unusual aspects of your oil purification problem.

HONAN-CRANE CORPORATION

302 Indianapolis Avenue, Lebanon, Indiana

A Subsidiary of

HOUDAILLE-HERSHEY CORP.



The constant flow of oil through the clutch acts as a cooling agent and makes this unit particularly adapted to severe service and high temperature operations found in the type of earthmoving work for which these machines are used.

Since friction material operating in oil has a much lower coefficient of friction, the engaging force (squeeze on the pressure plate) of an oil clutch must be higher than an equivalent dry clutch. On this account, Caterpillar has developed an engaging mechanism with a very high mechanical advantage and has specially hardened all of the highly loaded internal parts to reduce the pull required by the operator on the clutch handle. On the D8, the largest tractor Caterpillar makes, a booster cylinder

has been added to engage and disengage the clutch. This gives greater ease of control and also provides a short clutch lever stroke on this model. The D7, D6 and No. 6 Shovel do not require this booster. An innovation being introduced with this clutch is a universal joint which eliminates the need for close alignment between the clutch and transmission, thus causing lower maintenance problems in the clutch and transmission bearings and shafts.

This oil clutch represents more than 11 years of research and development by Caterpillar. However, the use of oil clutches are not entirely new with the company. Around 1920, the Holt 2-ton and 5-ton tractors made by Holt Manufacturing Company, one of Caterpillar's predecessors, used steer-



Looking over one of the first oil-type clutches to go into a Caterpillar D8 Tractor are three members of the company's engineering department who helped develop this new clutch. They are, left to right, Charles Ramsel, staff engineer; N. E. Rish, assistant chief engineer, and Milton Holland, engineering supervisor. Rish is pointing out the booster cylinder which engages and disengages the clutch, giving greater ease of control.

ing clutches and brakes which operated in oil. However, due to the heavy oils used those days there were difficulties encountered when the tractors were used in cold weather. The clutches would not transmit enough power to drive the tractors until the oil was heated, because the viscosity of the heavy transmission oils used varied so much with the temperature.

Adds High Pressure Filter



High pressure liquid and gas filters, manufactured in series 1H and 1HG respectively, have been added to the line of Micro-Klean filters made by Cuno Engineering Corporation, Meriden, Connecticut. Standard units are available for operating pressures up to 1000 psi. Filters designed for even higher pressures are available upon request. Construction is all welded steel with the head piece machined from bar stock. Pipe sizes for inlet and outlet connections are $\frac{3}{8}$ in., $\frac{1}{2}$ in. and $\frac{3}{4}$ in. Guaranteed

degrees of filtration through the Micro-Klean cartridges are 10, 25, 50 and 75 microns (.000394 in. to .0029 in.). Maximum capacity for liquid at 150 ssu., 2 pounds pressure drop and 50 micron degree of filtration is 15 gpm. For gases at 1000 psig., 2 pound pressure drop and 25 micron degree of filtration max. capacity is 200 scfm. (free air).

YOUR COPY OF DIESEL ENGINE CATALOG in its eighteenth completely re-edited, revised and expanded edition is now off the press. An invaluable aid to design engineers and buyers, it incorporates the latest diesel engine specifications and descriptions. Order your copy of this latest edition now. Profusely illustrated. \$10.00. Mail checks to DIESEL PROGRESS, 816 North La Cienega Blvd., Los Angeles 46, California.



FROM 100 K.W....

UNION Diesel generating sets are conservatively designed, carefully built and dependably rated. They provide more reliable power at lower cost. Installations both afloat and ashore throughout the world have proved that their use assure maximum, long-lived economy with minimum maintenance.

Applications include stand-by service with automatic controls as well as main line power source with high load factor.

UNION Diesels are available to suit your requirements arranged as

Dual Fuel
Full Diesel
Sparked Gas

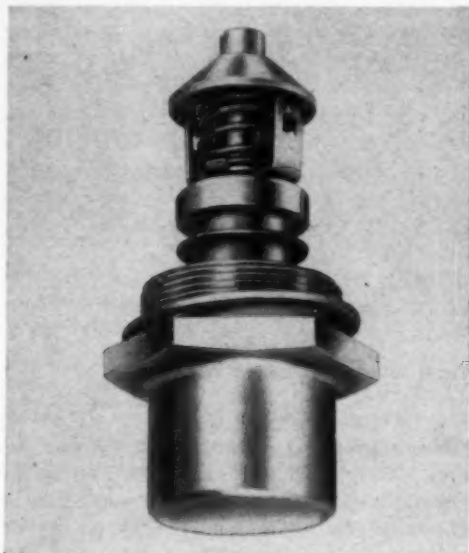
...TO 1250 K.W.

The UNION DIESEL ENGINE Company

2121 DIESEL ST., OAKLAND 6, CALIFORNIA, U. S. A.

AUTOMATIC CONTROLS

The present day diesel engine has come a long way from its early fore-runners. Its great efficiency and dependability were the key factors in its original acceptance as a power source. The present day engine has given the user an economy of operation and a minimum of maintenance requirements which would have been considered a fantastic dream not many years ago.



Vernatherm oil cooler thermostat.

The pattern in engineering design is clear. The constant effort has been toward minimizing and as far as possible eliminating the human element. As far as the immediate operation of the diesel engine is concerned, the operator's job has become a supervisory one. He watches the recording dials and signals and from the readings, he is able to tell if and when any unusual conditions have arisen. Guess work is cut down drastically.

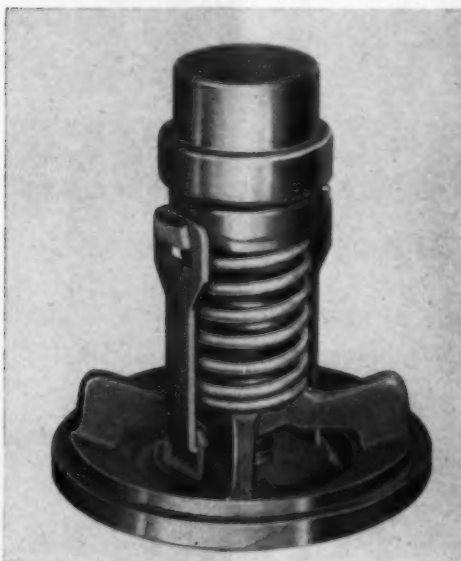
These advances in diesel engine design have been made possible by the development of automatic controls and signaling devices, controls which, if necessary, shut the engine down if no steps are taken to correct the condition. One of the important silent watchmen on any engine are the thermostats which control temperatures by regulating the flow of cooling water.

The Fairbanks-Morse opposed-piston diesel which was described in the May 1953 issue of DIESEL PROGRESS uses two "Vernatherm" thermostats. These thermostats are manufactured by Detroit Controls Corporation and are manufactured in several different types. The selection of a thermostat calls for the utmost dependability in operation on the part of the unit. Construction has to be simple and rugged yet sensitivity cannot be sacrificed. The operation must not be affected by changes in barometric or static pressures and extremes in temperature must be withstood without damage to parts or variation in calibration. The piston must move smoothly throughout its full stroke without any "chatter" when encountering quick fluctuations in temperature.

The operation of the "Vernatherm" control uses

as the power creating medium, the expansion of special materials which are highly sensitive to temperature variations. In operation, the thermostatic materials expand with the temperature increase to force a moulded synthetic plug into a reduced diameter in the piston guide which multiplies the movement of the piston by an extruding action. The plug and diaphragm seal are made from synthetic compositions of the company's development and are stable as to compression, hydroscopic absorption and ductility at sub-zero temperatures.

The movement of the piston is utilized to operate a valve disc, linkage or electric switch. The piston moves against the force of a return spring which causes the return movement and re-forms the thermostatic materials to their original shapes as the thermostat cools.



Vernatherm engine coolant thermostat.

The operating range of the thermostat is determined by the chemical composition of the materials and many ranges are available. Many combinations of temperature range, piston travel and maximum piston loads are possible. These are miniature size elements which lift a 30 pound load an eighth of an inch and larger sizes that can lift 200 lbs. through approximately 1/2-inch piston travel.

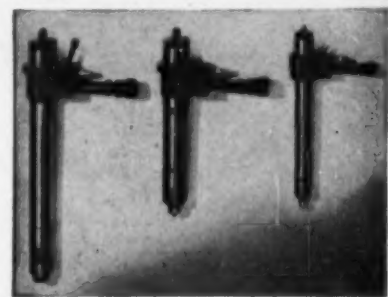
Pocket-Size Catalog

A new 16-page, pocket-size catalog (B55-53) listing prices and specifications for Morse Taper-Lock stock roller chain sprockets is now available from Morse Chain Company, 7601 Central Ave., Detroit 10, Michigan. The 3 1/2 by 6-in. catalog is printed on oil and moisture resistant paper. Tables in the catalog list: Horsepower ratings, Taper-Lock Bushing and sprocket specifications and prices, and roller chain and part specifications and prices for 1/2, 3/4, 1 and 1 1/4-in. pitch chain. Installation and removal procedures for Taper-Lock sprockets are listed in the catalog as well as horsepower selection charts, drive selection procedures and service factor tables. Prices for Morse Packaged Roller chains which can be had in individual boxes of 5, 10, 50 and 100-ft. lengths are also included.

You Can Depend On ADECO



The ADECO Model "P" Single-Unit Fuel Injection Pumps are of the "port-control" type. Simple and rugged in construction and precision built by ADECO craftsmen, these pumps are extremely reliable.



ADECO injectors are available in four sizes and a number of different styles and lengths. The ADECO water-cooled injectors are made in size No. 4 only, and have built a reputation for excellent performance where heavy fuel oils are burned.

When Ordering Fuel Injection Equipment
SPECIFY ADECO

ADECO PRODUCTS
INCORPORATED

Designers and Manufacturers of Diesel Fuel
Injection Equipment



5435 N. Wolcott Avenue, Chicago 40, Illinois

Elected Waukesha Director



Morgan R. Butler, Sr.

The Board of Directors of the Waukesha Motor Company has announced the election of Mr. Morgan R. Butler, Sr. as a director of the company. Mr. Butler is the president and treasurer of the Butler Bin Company in Waukesha, manufacturer of bulk materials handling equipment for the construction industry. He is a former Mayor of the City of Waukesha, serving in that office from 1926 to 1934. During his career in Waukesha in the past

forty years, Mr. Butler has been active in many civic and community enterprises. In addition to his terms as Mayor of the City, he has directed the activities of numerous charitable drives, and has been a leader of many other projects that have contributed to the development of the community. Mr. Butler has always taken a keen interest in the cultural and educational development in Waukesha. He has been president of the board of education since 1947 and an active member for the past seventeen years.

Displayed at Metal Exhibition

Flexonics Corporation, Maywood, Illinois, displayed its full line of flexible metal hose, expan-

sion joints, brass and stainless steel bellows and bellows assemblies, aircraft components and thermostats at the National Metal Exposition in the Cleveland, Ohio, Public Auditorium October 19 to 23. The exhibit included Flexoniflex stainless steel expansion joints, used under high pressure conditions, and Rex-Flex metal hose, available in standard wall thicknesses of .008 to .025 inches and diameters of 1/4 inch to 6 inches. Previously, this type of heavy wall hose was a special order item.

In addition, the company showed samples of new products now in the research and development stage, including stainless steel straight wall tubing for duct systems. Flexonics developed this tubing originally for the aircraft industry, to meet requirement for light weight combined with high tensile strength. Now, it is finding uses elsewhere in industry, where it is desirable to reduce the weight of piping. The new tubing is available in outside diameters of 1 1/2 to 6 inches and in both hard and soft metal. The hard tubing is suitable for straight runs, and the soft is for bends.

Host at Educational Meeting

General Motors Research Laboratories was host to college engineering professors from Indiana, Illinois, New York, Ohio, Michigan and other nearby states October 13 at an educational meeting of the Diesel Engine Manufacturers Association. Included was a tour of the General Motors Technical Center. The program was designed to give professors latest data on diesel developments for use in their classes covering internal combustion engines. Speakers were: Charles L. McCuen, GM Vice President and General Manager, Research Laboratories Division; Gregory Flynn, Jr., W. H. Percival, L. A. Aldinger and F. D. Thompson, of Research Laboratories; Eric Brater, Assistant Chief Engineer, Cleveland Diesel Engine Division, and R. D. Wellington, Detroit Diesel Engine Division.

Resident Engineer



George B. Furey

Appointment of George B. Furey to the Honan-Crane Sales Engineering staff has been announced by D. J. Jones, the company's General Manager. With headquarters at Honan-Crane's main office in Labanon, Indiana, Furey will cover central and northwestern Indiana including South Bend and Indianapolis. Furey has been with Honan-Crane's Engineering Department since March 1952. Prior to that time he was Bulk Materials Handling Engineer for Link-Belt in Chicago. He has studied at Iowa University and the Illinois Institute of Technology. Honan-Crane is a leading manufacturer of oil purifiers, oil and coolant clarifiers, and automatic materials-handling conveyors.

YOUR COPY OF DIESEL ENGINE CATALOG in its eighteenth completely re-edited, revised and expanded edition is now off the press. An invaluable aid to design engineers and buyers, it incorporates the latest diesel engine specifications and descriptions. Order your copy of this latest edition now. Profusely illustrated. \$10.00. Mail checks to DIESEL PROGRESS, 816 North La Cienega Blvd., Los Angeles 46, California.

Here's How You Can Get LONGER LIFE FROM DIESEL ENGINES

and... ▶ Eliminate Seat Distortion and Blow-by or Hot Spots Which Cause Valve Port Cracks!

Heat expands seat with downward pressure locking together. Drawing below shows expansion clearance between threads.

▶ Increase Valve and Seat Life Up to 300%!

▶ Greatly Reduce Valve Burning, Breaking, Sticking! Seat Stays Round—Cools Valve.



NOW, FOR THE FIRST TIME...

A VALVE SEAT INSERT FOR ALL DIESEL ENGINES!

No Radial Pressure

Stress-Relieves Valve Port Area

Locks-In Can't Come Out

Precision Installation

Replace Without Going to Oversize

Distorted intake seats in some engines require excessive grinding to true up because exhaust expansion has pushed on one side—this problem is absolutely eliminated by P-B.

Whether your diesel engine was designed for replaceable valve seat inserts or not—even though head or block is normally hot welded—you can get longer life from your engine and suffer less costly down-time by installing P-B Screw-in seat inserts... made of heat-treated Chromite material to retain its shape, wear longer.

Performance-tested in Diesels for over 15 years in Canada and the U.S., this new valve and seat maintenance program has proved its value in eliminating distortion around valve seats providing a perfectly round seat which allows valve to cool properly thus increasing valve mileage. 75% of the heat developed in valves is dissipated by transfer through valve seat to engine coolant.

Because the P-B seat is designed with expansion clearance and will not cock, buckle, or distort, valves seat perfectly on every stroke and will not bounce, flutter, burn, break or stick.

Whether your problem is head or block cracking around valve ports; valve burning and breaking; or costly, time consuming hot weld seat replacement—you can save money and trouble by installing P-B Screw-in Valve Seats with expansion clearance. Good pressure tested, laced up cold welds in valve port will not open up because P-B seat stress relieves the hottest point in the engine.

INSIST ON P-B

...Seats available for all Diesel engines including Sterling, Nordberg, Superior, LeRoy, Buda, Waukesha, GM Cleveland, Alco, Cummins and Cooper-Bessemer. Standard sizes in steps of 1/16" from 1 1/4" to 4 1/2" O.D. Larger sizes on request.

Contact Your Master Shop—now located in every major city in the U.S. If your engine maintenance shop can't supply, write direct to:

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LEADERS FOR 20 YEARS IN HEAD AND BLOCK VALVE PORT WELDING PROCEDURES.



Kansas City Meeting

The Muchlebach Hotel in Kansas City will be host to the 1954 Annual Meeting of the Oil and Gas Power Division of ASME. It is scheduled to take place June 14th to 17th. As in the past, manufacturers will be able to exhibit their products at the meeting. Space, however, is limited. All those planning to exhibit next year are urged to reserve their space early in order to avoid disappointment.

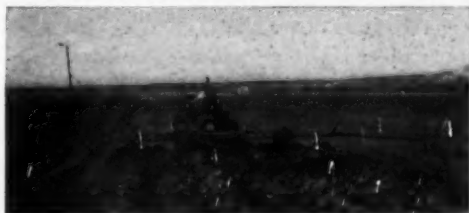
Aims for Production Record



Hauling average loads of 50 tons and averaging approximately 20 mph. on a round-trip haul of 8.5 miles, Hanna Coal Company's new fleet of 47-ton Euclid Coal Haulers are helping the company to decrease cost. Hanna hopes to set a production record at its Georgetown mine where the fleet of ten new "Eucs," built of special high strength alloy steel, are in operation. The mine is operating three shifts a day and the "Eucs" are being loaded in three minutes by seven passes of a nine-yard shovel. A complete cycle, including loading and dumping, is being made in an average of 29 minutes. Haul roads are well maintained and pass through rolling country with grades up to five per cent.

The units are the largest ever built by Euclid for hauling coal and are powered by 350 hp. GM diesel engines. Other features include spring mounting of the trailer and use of nylon cord tires of 28 ply rating. Dual trailer and drive tires are 18 by 25. Payload capacity is 94,000 lbs. or 62 cu. yds. struck and 70 cu. yds. heaped at a 3 to 1 slope. The units have a 10 speed transmission, air assist clutch and hydraulic booster steering. In addition to the 10 new units, Hanna is also operating a fleet of 15-ton Euclid rear-dump trucks with coal bodies. Working ahead of the haulage fleet are 45 yard stripping shovels one of which set a record by handling 1,522,000 cubic yards in 31 days during 1953.

Cotton Growing in Rio Grande Valley



One of the largest obstacles to cotton growing in the Rio Grande Valley, scarcity of water, is virtually eliminated by the new method of F. R. Palmer, Las Cruces, New Mexico. With his dieselized Cat D6 Tractor and tool bar modified to carry pipe listers, eight planters, four two-row harrows, a 28 ft. gang of cultivators or tow a 25 ft. drag he handles eight rows at a time with one man hour and about 2.75 gallons of diesel fuel per hour average. Palmer makes cotton rows more than a mile long

instead of the customary 800 feet. Irrigation of these long rows is efficiently accomplished with a tapered fall of the fields, steepest at the input end and level during the final 1000 feet. The irrigation run was expected to take six hours but actually takes four hours. By limiting the quantity of water per row the time of water on the area can be controlled for desired penetration.

This Cat-powered tool arrangement and farm layout enable completion of about nine acres per hour and in each operation more than 300 acres is handled in only three 12 hour days. Irrigation which took about four weeks to complete with 800 foot rows now takes a little less than two weeks with the same head of water. The Palmer system of

harrowing with his tractor only a few days after pre-plant irrigation while the fields are still muddy and long before a wheel tractor could enter, creates a deep mulch of mud balls which become tiny clods when dry. This mulch won't blow and cut early cotton. In spite of the high winds this year he had no replanting though fields around his farm suffered from the winds. The method saves by actual timing, about 1,000 hours per year by the elimination of turns. This is the equivalent of an extractor, implements, man and fuel eight hours a day six days a week for five months or more to do nothing but turn around. Mr. Palmer expects at least 30% greater yield from a better stand and timely planting afforded by this method and his Caterpillar machinery.

WHAT'S YOUR APPLICATION

???

13 HP, V Type air cooled Hallett Diesel with 20:1 compression ratio.

Original equipment manufacturers everywhere are depending upon Hallett, the leader in lightweight, economical, dependable, Diesel engines. Find out for yourself how a Hallett can add customer appeal to your product and give added years of trouble free dependable Diesel service.

Sales and service throughout the world.

District Sales Offices:
Washington, D.C., 13th and E Streets; Detroit, Mich., Book Tower Bldg.; New York, N. Y., Grand Central Bldg.; Chicago, Ill., 600 So. Michigan Blvd.

3 HP @ 1500 RPM, dependable, single cylinder, water cooled Hallett Diesel used throughout the world.

5 HP @ 1800 RPM, lightweight, air cooled Hallett Diesel weighs less than 240 pounds.

18 HP, water cooled unit preferred by original equipment manufacturers and foreign buyers everywhere.

HALLETT MANUFACTURING COMPANY
1603 West Florence Avenue • Inglewood, California

My application is _____

Please send me full details on the Hallett Diesel Engines.

Name _____

Firm Name _____

Address _____

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Engineering Consultant



L. J. Knight, Jr. Captain L. J. Knight, Jr. has been appointed engineering consultant of Western Gear Works, Lynwood, California, according to an announcement made by Thos. J. Bannan, president of the company. Captain Knight graduated from Ann Arbor in 1927, completed a postgraduate course in naval engineering at the U. S. Naval Academy in 1937, and a mechanical engineering course at the University of California, Berkeley, in 1938. He saw

action as engineer officer until 1944, acted as instructor and held other senior offices with the armed forces until retired in 1949. He is also on the staff of the University of California, Los Angeles, as an associate in engineering and principal extension representative. Western Gear Works is the largest organization of its kind West of the Mississippi, with six plants ranging from Texas to Washington.

Issues "Blue Book"

D. W. Onan & Sons Inc. of Minneapolis has issued a "Blue Book" of general information concerning the selection of engine driven electric generating plants. The pocket sized booklet traces the history

of electric plant development from early stages where storage batteries were necessary to today's modern, single-unit, engine-generator power plants. Described in simple, easy-to-understand language are the three general groups of electric plants: alternating current (ac), direct current (dc), and battery charging. Plant operation for each type is thoroughly discussed.

The booklet reviews the three types of prime mover which furnishes the mechanical power for driving the generator, namely: gasoline engine, diesel engine and gas engine. Cost of operation and installation of each type is discussed. Differences of engine cooling are compared, starting methods are described and a concise summary of important points to remember in selection of an electric generating plant is also included. Copies are available by writing the manufacturer. Ask for a copy of the "Blue Book."

Fast Loader



This $\frac{3}{4}$ yard Bucyrus Erie 20B shovel owned by Thompson-Strauss Quarries, Norris, Kansas, can really produce. Used by Thompson-Strauss for loading trucks from the stock pile, the shovel can load nine ton of material on a truck in two minutes. The Norris, Kansas firm repowered the shovel one year ago with a 110 hp. Model HRIP-400 Cummins diesel. Besides cutting fuel consumption in half, the owners report the Cummins has more power and as a result the shovel is much faster in the swing.

Industrial Sales Representative

The Heat-X-Changer Co., Inc., of Brewster, N. Y. has announced the appointment of H. C. Halbert, Atlanta, Ga., as industrial sales representative in the territory covering Tennessee, Alabama, Georgia, and Florida. Heat-X industrial heat transfer products which he will handle include inner-fin oil coolers for hydraulically operated equipment, diesel engines, etc., and inner-finned water cooled aftercoolers for compressed air systems. Mr. Halbert has been in the compressed air field for over 30 years, handling compressed air and hydraulic equipment as a manufacturers' representative in Atlanta for the past 14 years.

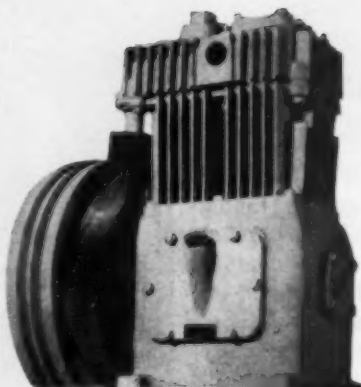
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You can't fool us! You're an alert businessman who knows the value of dependable compressed air supply. And Quincy Compressors give years of first-class service because they're ruggedly built for long use.

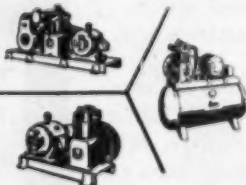
Depend on a Quincy Compressor specialist to help you select the right compressor for your needs. There are modern, compact Quincy Compressors, a variety of mountings... sizes from 1 to 90 c.f.m. You'll see them all in Quincy's complete line catalog. Write Dept. K-33 for your copy.



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Executive Vice President



Fred W. Stakelbeck

G. J. Keady, president of The Sharples Corporation, Philadelphia, centrifugal and process engineers, announces the appointment of Fred W. Stakelbeck to the post of executive vice president. Mr. Stakelbeck joined the company in 1934 and served in Sharples sales offices in Chicago, Dallas, and Cleveland, prior to being made works manager in 1943. In addition to his new duties he will continue as vice president in charge of production.

Expansion Joint Bulletin

An illustrated eight-page bulletin describing the Flexon line of expansion joints has just been released by Flexonics Corporation, formerly Chicago Metal Hose Corp., Maywood, Illinois. The bulletin presents all basic data necessary to the proper selection and application of pipeline expansion joints.

Highlights of the bulletin include a discussion of types of pipeline motion frequently encountered, and methods of handling this motion. Also covered are complete specifications for low and high pressure units, and detailed information on special types of joints including Flexoniflex, good for pressures to 5,500 psi. An extremely important section deals with the proper guiding and anchoring of expansion joint installation. For a copy write Flexonics Corporation, 1325 South Third Avenue, Maywood, Illinois requesting catalog #133.

Executive Seminars



A. W. McKinney, executive vice president of The National Supply Company, Pittsburgh, Pa., is shown addressing the company's executive seminar held at Pittsburgh August 31 through September 18, 1953. The seminar is part of a one-year training program organized by the company every year for about 20 promising college graduates. The faculty of the seminar is headed by A. E. Walker, president and chairman of the Board. Other company executives and department heads lecture on the company's operations under their jurisdiction.

Prior to the Pittsburgh seminar the trainees work for several months in one or more of the company's 117 oil field stores. After the seminar the trainees visit the company's six manufacturing plants. The

company operates pipe mills at Ambridge and Etna, Pa.; a diesel engine plant at Springfield, Ohio; and oil field machinery and equipment plants at Toledo, Ohio; Houston, Texas; and Torrance, Calif.

Annual Meeting

The 61st Annual Meeting of The Society of Naval Architects and Marine Engineers will be held in New York City at The Waldorf-Astoria on November 11 to 14, 1953. These annual meetings of the group have been the feature and culmination of each year's activities since the formation of the Society in 1893. The Council, governing body of the organization, will meet on Wednesday, Novem-

ber 11. Technical sessions in the morning and afternoon of November 12 and 13 will follow, these being open to the entire membership and guests.

The Annual Banquet, restricted to members only, will be held in the Grand Ballroom of The Waldorf-Astoria on the evening of Friday, November 13. The Annual Dinner Dance for members and their guests will also be held in the Grand Ballroom, being scheduled for Saturday, November 14. The Executive Committee of the Society met on September 22 at the New York office to pass on pending applications for 166 new members and to consummate plans for the annual meeting. After the election of these new members, the membership of the Society will total 6,336.

RUGGED . . . POWERFUL . . . MANEUVERABLE EASY TO INSTALL and SERVICE HARBORMASTER OUTBOARD PROPULSION



SPECIAL features not found with ordinary marine power make Harbormaster Outboard Propulsion and Steering Units tops for performance and most practical for tough jobs. Where you want rugged, dependable operation with a minimum of service and maintenance, and where extreme maneuverability and heavy duty power is demanded, Harbormaster is best for the job.

Harbormaster Model O-41H, 50 h.p., gas power shown at left. (Model O-42, 40 h.p. diesel is similar in appearance.)

HARBORMASTERS proved in exhaustive use

Hundreds of Harbormasters are now in continuous, heavy duty marine work. Shown below is pusher type boat with 3 Harbormaster Outboard Units used for pushing 200-ton barge loads 25 miles up a shallow river . . . requires only 3 foot draft!



Here's why HARBORMASTER is tops

- **Easily installed for immediate use**
Can readily be installed on most barges, scows, towboats, tugs, derricks, lighters, etc. Is completely assembled and lined up in our plant.
- **Steers instantly in any direction with full power**
You get the ultimate in maneuverability with the exclusive patented M&T 360° Propeller Thrust Steering Control.
- **Underwater parts easily accessible for maintenance or repair**
Special 180° elevating mechanism allows one-man operator to raise entire submerged assembly to any degree he desires. No dry docking or diving to make repairs is necessary. Greatest maintenance efficiency of any heavy duty propelling and steering equipment.
- **Opens new shallow water fields to continuous operation**
Hulls with Outboard Propulsion can be designed for operation in shallow water where inboard powered hulls are impractical. Patented shear pin automatically shears off should underwater assembly strike submerged obstacle. Assembly rides over obstacle, free from damage, without loss of forward motion and operating power! New pin easily replaced while you are under way.
- **Economical to operate**
You realize big savings in fuel expense because you get more thrust per horsepower with outboard propulsion.

Specifications:

Sizes available from 20 to 300 h.p., gas or diesel power.

Model O-41H (illustrated)	
Engine H.P.	50
Engine R.P.M.	2300
Propeller diameter	30"
Propeller pitch	15"
Propeller R.P.M.	608
Fuel tank	16 gallons
Cooling radiator	
Height above deck	48 3/4"
Width	36 1/4"
Weight (dry)	2780 lbs.



Write today for catalog.

Write today for comprehensive catalog on Harbormaster Units. Catalog gives detailed data and valuable information, including over 70 photos and diagrams. Whether you have immediate or future use for Harbormaster Units, send for the catalog so that you will have full information on the advantages of outboard power.

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A Standard Specification
... AMONG AMERICA'S LEADING DIESEL ENGINE BUILDERS FOR MANY YEARS

Precision Tolerances and Finishes as your Requirements demand . . . Turn to Titusville for Engineering and Research Counsel—an organization of master Craftsmen with facilities second to none in the industry.

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THERE IS NO SUBSTITUTE FOR EXPERIENCE

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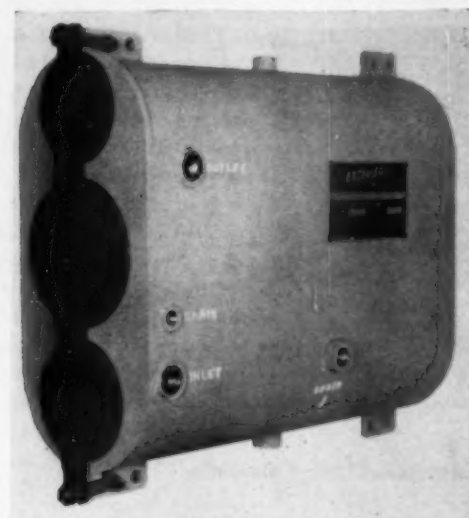
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The Nation's Largest Distributor of GM Diesel Engines

New Compact Water Separator Filter



A new Excel-So combination water separator, micron filter for diesel fuels has recently been introduced by the Warner-Lewis Co. In the past, Warner-Lewis Co. has specialized in making large filtering units for bulk diesel fuel processing, but they have designed the compact Model FEQ-5 filter to meet the needs of individual engine operators. This new Excel-So unit is claimed to have universal application in the diesel field—marine, railroad, pipeline pumping engines, power plant engines, drilling rigs, and trucks and buses, to mention a few. The unit measures 22 inches long, 18 inches high, and 8 inches wide and is of cast aluminum construction with universal mounting brackets and standard connections for easy installation directly on fuel supply lines. It has a rated capacity of 5 gpm. and delivers fuel to the injection system 99.995% water free and solid free to 5 microns even at temperatures as low as 35°F. Where the rate of fuel flow is more than 5 gpm., two or more units can be manifolded in combination to provide greater flow rate. (The addition of each unit increases the flow rate by 5 gpm.) The FEQ-5 is tested up to 50 psi.

Problems of engine operators with water in diesel fuel have lead to the development of special filtering units because ordinary fuel oil filters cannot separate water out of fuel effectively. Warner-Lewis Co. takes water out of fuel by the following method: tiny droplets of free water suspended in the fuel are coalesced into large droplets through a "wood-fiber" coalescing media. This is called forced coalescing or mechanical separation. Then these heavy droplets are transferred through a baffle and drop down to a sump, where they can be manually drained off when necessary.

Water is introduced into diesel fuel by transferring and general handling of the fuel, condensation in fuel tanks, and rain and dew seeping into leaky fuel tanks. Water in fuel is injurious to injection systems because it erodes and corrodes injector orifices, and corrodes and rusts injector parts, thus causing expensive repairs and downtime. By removing virtually all the water in fuel, engine life can be increased and repairs and maintenance to injection systems can be cut down. For an informative, 4-page folder on the Model FEQ-5, write Warner-Lewis Company, P.O. Box 3096, Tulsa 8, Oklahoma, requesting Bulletin FEQ 5-53.



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500 Series Rotary Geared Pumps

If your problem is high-pressure lubrication, Brown & Sharpe 500 Series Pumps are your answer. They're designed to operate at pressures up to 500 psi . . . built to run smoothly and dependably at high speeds. Self-balancing mechanical seal

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For further information, write for Pump Catalog. Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

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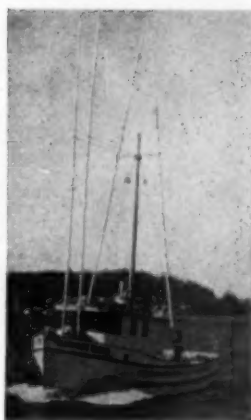
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A WIRKKALA PROPELLER

. . . drives the ocean troller HARVEST QUEEN. Captain Wally Leback reports great improvement with a WIRKKALA PROPELLER.

Captain Wally Leback, after the first trip out with the new wheel on the HARVEST QUEEN, reports: "There has been a great improvement in overall performance—more speed at cruising RPM . . . the engine will idle down to 300 RPM with no gear lash or vibration . . . also silent propeller performance at all speeds."

Salmon are allergic to excessive propeller noise and vibration.



HARVEST QUEEN, 46 ft. troller built by Ilwaco Boat Works and powered with a 6-71 GM Diesel with a 3:1 reduction gear, and 40 x 24 in. WIRKKALA propeller.

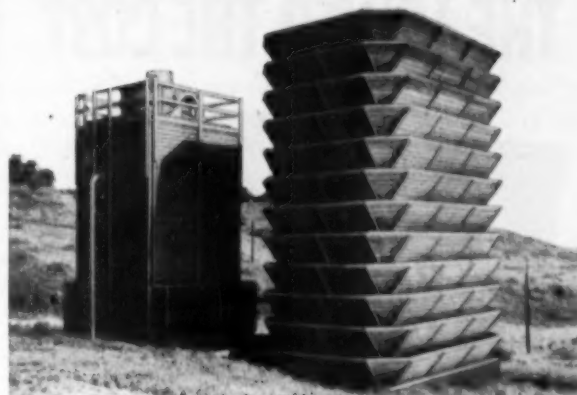
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Invented by Mr. Oscar Wirkkala and tested under the severest operating conditions, this new WIRKKALA propeller has proved itself the most advanced propeller in use today. Protected by world patents.

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Here are two good reasons . . . these Pritchard Cooling Towers shown above. They provide maximum operating efficiency in the cooling systems of the modern diesel operation at the Central Electric and Gas Company in Chamberlain, South Dakota. The need for such efficiency is the reason this progressive company chose Pritchard.

Built by Pritchard—a founder member of the Cooling Tower Institute—means experienced, expert design and quality construction that provides long, dependable cooling service. Every Pritchard tower is thoroughly engineered and adequately sized for maximum efficiency, minimum maintenance . . . is unconditionally guaranteed to meet your most exacting performance requirements. That's why—both when you buy and over the years—your best value is Pritchard!

Pritchard QUINTAIR® Air-Cooled Heat Exchangers are accepted throughout the industry as the quality equipment for cooling diesel engine jacket water and lubricating oil. Practical Pritchard design simplifies maintenance, increases operating efficiency. Single units may be used for two or more simultaneous cooling jobs. Shipped completely fabricated . . . ready for fast, easy installation.

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- LOWER ORIGINAL COST
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- NO EXPENSIVE BACK UP SUPPORT REQUIRED
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It seems hard to believe, but you can actually have more efficient filtration at considerably lower cost if you simply use Bendix-Skinner ribbon elements instead of expensive and less adaptable metal edge or metal screen types.

Here's how it works—Bendix-Skinner ribbon elements are inexpensive to begin with and can be installed at far less cost than metallic elements that require special back-up supports. In fact, in practically every instance present metallic-type elements can be changed over to ribbon-type with substantial savings.

Ribbon units are available in diameters from $\frac{1}{2}$ " to 6" in any required length with filtration rated at 40 microns (.0016").

Our engineering department will be glad to advise on new installations or to furnish replacement units in a variety of sizes. Write us for details.

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For distributor's name or information on special governing problems, write



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Testing Torque Converters



For testing torque converters during their development the desired accuracy and convenience were recently provided by use of two SR-4 Torquemeters and two SR-4 Load Cells for measuring torques and thrusts. These devices, which are made by Baldwin-Lima-Hamilton Corporation, incorporate SR-4 bonded resistance wire strain gages as the load sensing elements. Load and torque indications are obtained by means of simple electrical circuits, using a Baldwin Type L SR-4 strain indicator which is under the operator's left hand on the control console. In this test set-up at the Toledo plant of The National Supply Company the Baldwin torquemeters are on the driving shaft (left) and driven shaft (right) of the torque converter, which is in a transparent enclosure. A 250-hp. diesel engine, partially visible through the door, drives the converter pump through an SR-4 torque pick-up of 12,000-in.-lb. capacity. The output shaft drives an eddy-current brake through a 30,000-in.-lb. torque pick-up.

Test values of hydraulic thrusts parallel with the shaft were measured by means of an SR-4 load cell enclosed below the driven end of the shaft and activated by two vertical levers, one of which can be seen there. Another SR-4 load cell was placed on the driving end with a lever system to measure the torque of the reaction member of the converter.

During tests the operator uses the engine throttle in his right hand and other instrumentation, including tachometers, oil pressure gages, and control equipment for the dynamometer.

Miehle-Dexter Bulletin

How Miehl-Dexter superchargers boost the power of diesel and gasoline engines is the subject of a new descriptive bulletin issued by the Miehl-Dexter Supercharger Division of the Dexter Folder Company, Racine, Wisconsin. This four-page folder illustrates and describes the Miehl-Dexter supercharger, and points out that the addition of a supercharger to current or projected engine designs is said to be easy, and is often a less costly way to obtain additional power without increasing space requirements or engine weight. The bulletin also points out that Miehl-Dexter units are often used as blowers on industrial applications requiring air or gases at moderate volume or pressures. A simple table and graphs are included in the folder, making it easy to determine the proper size unit to be used on various applications. The folder is available by writing the Miehl-Dexter Supercharger Division, Dexter Folder Co., Racine, Wisconsin, requesting Bulletin No. 153.

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DIESEL ENGINE CATALOG VOLUME 18

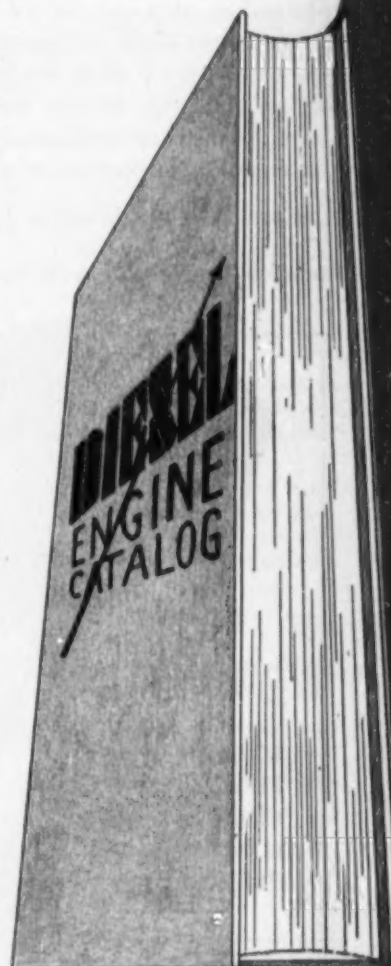
DIESEL ENGINE CATALOG is the only volume of its kind written and edited by experts under the critical guidance of Rex W. Wadman, editor and publisher of DIESEL PROGRESS. It includes the latest specifications, essential data, descriptions and illustrations of products of every major engine builder.

In addition, the classified buyers section, the accessory section, the transmission section and the advertising section bring you an additional wealth of vitally important information . . . information you must have at your fingertips for efficient operation and servicing of your equipment.

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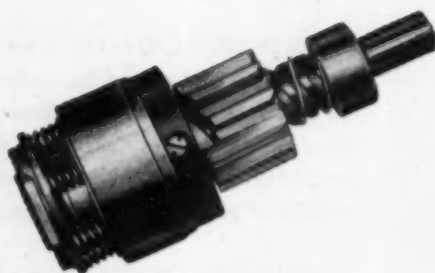
- Starting motor can be mounted more easily and in more positions.
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It takes a truly outstanding product to receive over 85,000,000 endorsements. Yet, that's the number of Bendix Drives that have been installed. No other starter drive approaches this record of outstanding performance. That is why, whatever your type of diesel or whatever its purpose, it will pay you to specify Bendix* Starter-Drive for the most economical installation and dependable performance. *REG. U.S. PAT. OFF.

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Bulletin 294

BACHARACH
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Inland River Reports

By David I. Day

AT WORK on the Ohio River is the *Jeffboat* built at Jeffersonville Boat & Machine Company at Jeffersonville, Ind., for the American Barge Line, and launched in September. The *Jeffboat* is 160 x 35 x 12 and is powered with twin Caterpillar diesel engines, totaling 1600 hp.

CHARLES FIELD, chief engineer on the *Lin Smith* of the Mississippi Valley Barge Line, is highly pleased according to recent report with the performance of the twin Cooper-Bessemer in his charge. The power is rated at around 3300 hp. The boat, built by Nashville Bridge Company back in 1946, has been recently repainted and looks like new. We noted her recently passing down the Ohio with 15 loaded barges and two empties.

THE GAME little *Ouachita* of the Southern Barge Lines, Vicksburg, Miss., has made a favorable impression on the old-time rivermen, especially those on the Ohio around Cairo and Paducah. She is only 90 feet long and uses two General Motors engines with a total power of 1800 hp. She is usually moving fast with about three barges in the long oil trades.

THE *L. Wade Childress*, one of the best of the Mississippi Valley Barge Line fleet has been towing around New Orleans for quite a while. We hardly recognized her passing Cincinnati on her way to local towing assignments on the upper reaches of the Ohio. We recall the first trip she made after being launched at Dravo yards five years ago. She is a 3000-hp. vessel, using twin General Motors diesel engines, helped by a Kort Nozzle installation.

THE *Robin-E* of the Texas Towing Company has been renamed the *Reba Jane*, owned by the Thomas Petroleum Transit Company, Vanport, Pa. She is the first river towboat built by the Gulfport Shipbuilding & Drydock Corporation at its Port Arthur, Texas, yards, coming out in 1948. She is propelled by a single 1700-hp. Enterprise Diesel engine.

THE NEWEST and most powerful of the Union Barge Line towboats, the *Southern*, is now at work. She is a source of pride to all concerned with the Dravo yards near Pittsburgh. Equipped with twin Superior Diesel engines generating 3000 hp., with British-made reduction gears, she has a very fine cabin arrangement that will please the crews throughout her work-life.

FROM Keokuk we went south to Memphis, noting a number of large oil tows coming upriver at various points. One of the propelling boats was the veteran *Chas. W. Snider*, which we saw on her first work trip in 1942. She has Cooper-Bessemer engines, three of them.

FROM Mrs. Laura Egloff, Pennsylvania vacationist, we have color pictures from Vicksburg. Two are of the M.V. *Winchester*. She is now the property of Jordan River Line, New Orleans, a neat pusher using twin General Motors diesels, about 1800 hp.

DIESEL PROGRESS

In Charge of Domestic Sales Activities



Donald H. Spicer

American Bosch vice president Donald H. Spicer, who has been in charge of manufacturers sales for American Bosch Corporation, Springfield, Mass., is now also in charge of service sales activities for that company, according to an announcement by Donald P. Hess, American Bosch president. Vice president W. C. Robinson, who formerly had charge of service sales, is now heading the project of constructing an American Bosch branch plant in Columbus, Mississippi and is devoting all his time to that activity.

Mr. Spicer came to American Bosch last year from World Bestos Company of New Castle, Indiana, where he had served as president since 1941. He has served two terms as president of the Brake Lining Manufacturers Association, was a director of the Friction Materials Standard Institute and is a member of the Society of Automotive Engineers. American Bosch Corporation is a prominent manufacturer of automotive and aviation electrical equipment, fuel injection equipment for diesel engines and various components for jet aircraft.

Virgin Islands Installation



Constructed to serve the whole island of Thomas, U. S. Virgin Islands, with electric power is a generator set powered with an Enterprise DSQ-318 diesel engine, 1765-hp. generating 1240-kw. Existing equipment will help handle peak loads. The Enterprise 1765-hp. diesel engine is in background of the photo. Shown left to right are: Gordon Skeck, president, Virgin Island Corp., Power Division; L. Hamilton, engineer, Enterprise Engine & Mach. Co., and H. Martin, engineer, the Power Division.

Sales Agency

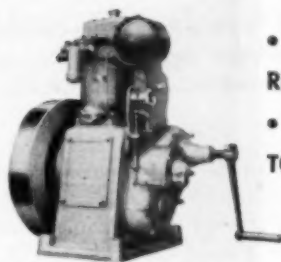
Wilkening Manufacturing Co., Philadelphia, Pa., announces the appointment of Seneca Tool Corp., 75 Murray St., New York City, as agent for the sale of Pedrick piston rings to railroads in the East Central and Northeastern States. Seneca Tool Corp. has been serving railroads for many years and now can offer complete engineered sets of piston rings specially developed by Wilkening engineers for big-bore diesel engines.

NOVEMBER 1953

COVENTRY VICTOR DIESEL ENGINES

Features

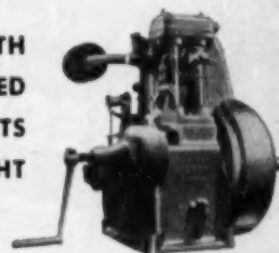
- EASY COLD STARTING • SMOOTH RUNNING • COMPACT AND RUGGED
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4 to 7 B.H.P. Air-Cooled

Marine Diesel Engines from 5 to 11 H.P. with reduction and reverse.

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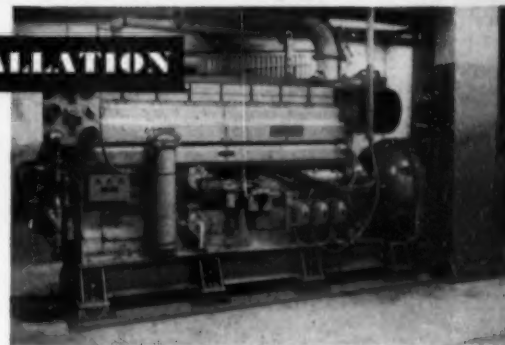
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The COVENTRY VICTOR ENGINE Co. TORRANCE, CALIF.

STOP VIBRATION WITH KORFUND VIBRATION CONTROL

A CIVIL DEFENSE INSTALLATION

Korfund Vibration Control helps protect vital telephone service! This Sterling 8 cyl., 535 HP engine is on standby service for the Pacific Telephone and Telegraph Co., in California and is capable of delivering 400 KW to assure continuous telephone service in the event of power failure due to enemy action or other causes. Korfund Vibration Control assures vibration-free operation of the engine thereby protecting the delicate relays in electronic telephone switching operations, and preventing vibration and noise transmission to other parts of the building.



Install Engines Anywhere

Whether they are intended for standby Civilian Defense and other emergency use, or for day-to-day regular service, you CAN install engines anywhere with positive freedom from objectionable vibration by using Korfund Vibration Control Units.

Korfund Vibration Control permits engine installation even in hospitals, office and apartment buildings, on truck trailers, railroad cars, or ships. Efficient and economical Korfund Units stop vibration, and reduce engine and building maintenance costs; reduce noise level; and frequently eliminate the need for special foundations.

THE KORFUND CO., INC.

For more information, see our page in the "Diesel Engine Catalog", or our catalog in Sweet's Files— or write for your copy of our Bulletin No. 11.



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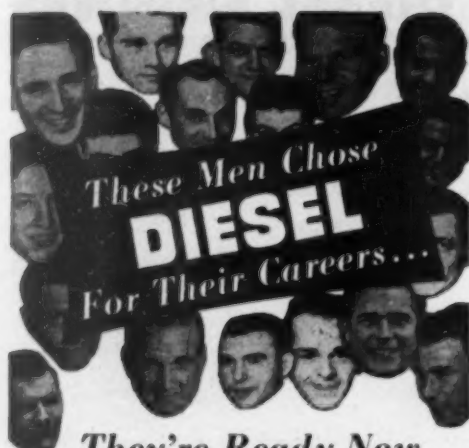
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Florida Diesel News

By Ed Dennis

THE *Mike King*, one of the latest all steel shrimp trawlers built by Bellinger Shipbuilding Co. at Atlantic Beach, is powered with a 190 hp. General Motors diesel.

SHELLEY Tractor & Equipment Co. repowered a model 1055 P&H dragline with a Caterpillar model D 364 diesel; another repower installation job was done on the Belcher Towing Co.'s *Margaret B.* A D 337 Caterpillar increased the power and speed on this familiar coastal tug boat by several knots.

GEORGE W. Gibbs, president of Gibbs Corp., Jacksonville has announced the promotion of Henry L. Hartley to vice president. Prior to his promotion, Mr. Hartley was sales manager of marine sales; he has been associated with Gibbs Corp. for the past 25 years and is immediate past president of the Propeller Club, Port of Jacksonville.

TWO model HRBI 600 Cummins diesels rated at 160 hp. for use in Ranson road rollers; one to the Dominican Republic shipped via airplane, the other for Cone Bros. of Tampa; from Cummins Diesel Engines of Fla.

THE *Bimini Joy*, a Bahama Islands freighter was repowered with a General Motors 6-71 diesel rated at 165 hp.; 3:1 reduction gears, Twin Disc clutch; by Auto Marine Engineers of Miami.

FOR THE Haytian Tractor and Equipment Co., three Model D 8 Caterpillar tractors delivered at Port au Prince, Haiti.

THE International Fishing Boat Congress will be held at Miami Beach November 16 to 20 in conjunction with the sixth annual session of the Gulf and Caribbean Fisheries Institute. On the program are such subjects as shape and construction of fishing vessels and diesel engine operation. Delegates are expected from North, Central, and South America as well as from the Caribbean Islands.

J. FRANK Knorr Co. engineered the installation of a model N.K.D. 6 cyl. Waukesha for runway lights at Miami International Airport. It also included a 150 kw. Electric Machinery generator, Delco Remy starters and generators and Exide batteries.

DIESEL BRIEFS . . . a 125 hp. Murphy diesel in the 60 ft. fishing boat *3 Bros.*; the *Sea Hag* received a model 4-51 General Motors with a 2:1 reduction gear and the dragger *Clipper* had a GM 6-71 with 4.5:1 reduction gears and 3:1 GM power take-off; installed for greater power and speed.

AMERICAN Bosch Corp., Springfield, Mass., announces the appointment of Dade Diesel Co., Miami as their authorized service agency for American Bosch diesel fuel injection equipment.

SUPPLIED by Florida Georgia Tractor Co., Miami for use at the C. Meekins Rock Co. in Hollywood a T.D. 24 International diesel tractor with hydraulic bullgrader, also a T.D. 6 International diesel tractor to the American Steam Co.

DON'T REPLACE

Your broken castings

THEY CAN BE REPAIRED

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- ▶ No matter how badly broken your casting is, it can be repaired the Guth-Pascoe way!
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5 RANGES IN
ONE INSTRUMENT
CATLG. 303: 30-12,000 RPM
FOR DETAILS WRITE
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NO. 750.

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WITH MIEHLE-DEXTER SUPERCHARGERS**

- For Internal Combustion Engines
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Division of Dexter Feltzer Company
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"UNIFLO'S" unique design and construction result in lightweight, compact and adaptable unit.

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Either vertical or horizontal—can be supplied with "offset", "tangential" or "horizontal" inlets and outlets to suit any arrangement of piping. Meets U. S. Military Specifications. *T.M. Reg.

Send for Illustrated Bulletin DP-728

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SPEED AND PRESSURE GOVERNORS

**Designed for Pipe Line, Gasoline Plant
and Refinery Control**

THE Massey Machine Company has developed a speed and pressure governor for control of engine speed from suction pressure or discharge pressure of engine driven pumps and compressors. The pressure control unit of the governor is pneu-

matic, operating from a controller, and the governing unit is a standard Massey Type HP Hydraulic Isochronous Governor with proportioner control so that it is interchangeable on mounting, drive and throttle linkage with standard Massey Governors.

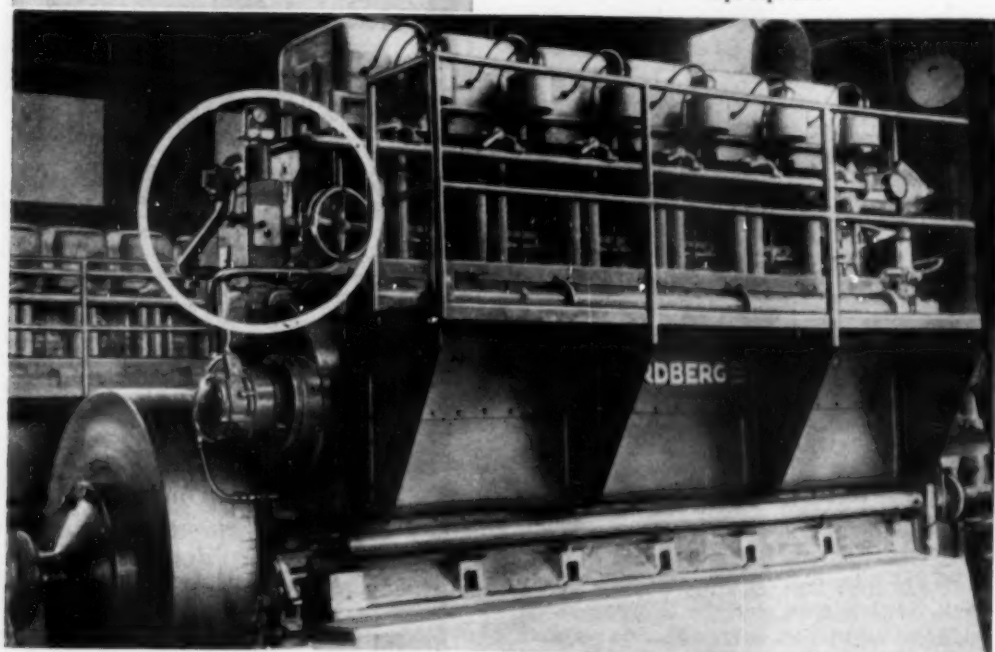
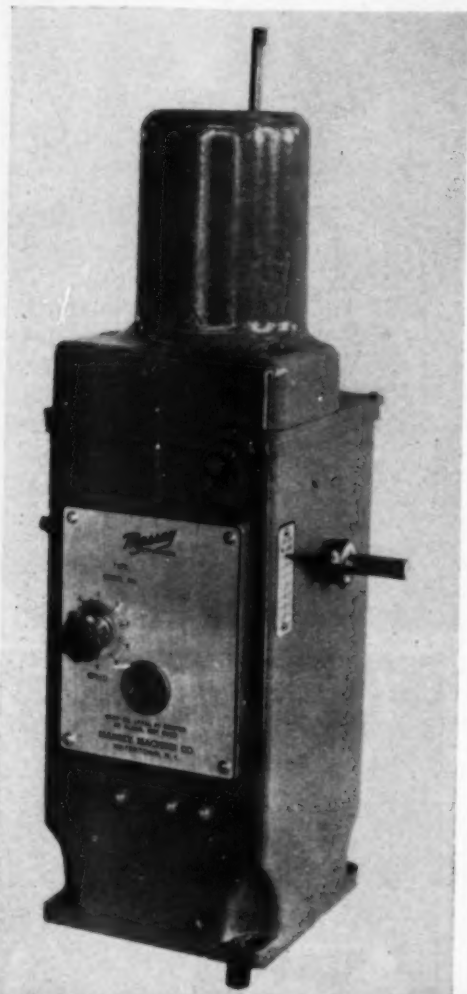
A typical application of this governor is on the eighteen Nordberg engines of the new Phillips Pipe Line Company in the Texas Panhandle. The engines are spark fired Nordberg Supairthermal gas engines driving centrifugal pumps. Engine speed is controlled through the governor in such a way that as suction pressure to the pumps increases it will speed up the engines in that station, but if discharge pressure becomes too high it will slow the engine down.

The governor has a very unusual combined stability of pneumatic and hydraulic systems for this variable speed operation due to the proportioner system of the governor keeping a force balance at all times. Hysteresis is eliminated because pilot valve lap is not necessary for stability and pneumatic pressure change is balanced without going through linkage to cause friction.

A convenient feature of the governor is that it still has hand dial control of speed and a simple adjustment of range so that the same governor can be used for different pressure conditions on the same line or in the same plant.

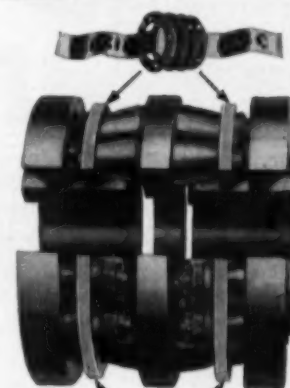
The Massey speed and pressure governor for the control of engine speed from suction pressure or discharge pressure of engine driven pumps or compressors.

View of the Massey governor on one of the Nordberg engines on the Phillips Pipe Line.

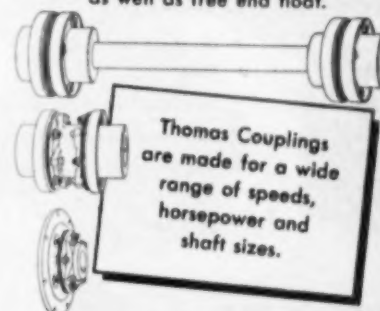


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CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



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*Excerpts from letters in our files.

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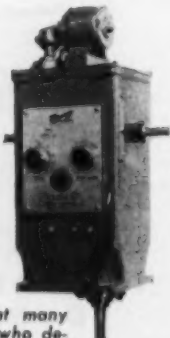


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West Coast Diesel News

By Fred M. Burt

INSTALLED by Buda Engine and Equipment Co., Inc., Seattle in a beautiful Seattle cruiser, to replace a well-known gasoline engine, the new model Buda diesel engine, 6-DAMR-273, 50-hp.

REPLACING another engine in the 38 ft. fishing vessel *RoMar* of Newport Beach, Calif., owned by Harry W. Stevens, a Caterpillar D-215, 53-hp. diesel with 3:1 Twin Disc reduction gear.

REPOWERED with a 275-hp. Cummins Diesel engine was a DW-20 tractor; by Kuhn & Lane of Brawley, Calif.

A NEW position instituted by Hallett Mfg. Co., Inglewood, Calif. is that of sales representative in the truck and railroad refrigeration field using Hallett diesels; filled by V. C. Capler, headquarters at main office, Inglewood; in the New York City office, the branch manager as of Oct. 1 was Geo. S. Wuchinilich.

FOR POWER on General Petroleum drilling rigs in San Joaquin Valley field, from Shepherd Tractor Equipment Co., Los Angeles, two Caterpillar diesel electric sets, each of 50-kw. with 92-hp. Cat diesel engines.

FROM Evans Engine & Equipment Co., Seattle, Wash., for Marvel Lumber Co., Olympia, Wash., a General Motors 6-71, 200-hp. diesel for saw mill power.

J. A. THOMPSON & Son, Los Angeles contractors, have repowered one of their Woolridge Terra Cobra's with a 220-hp. Cummins diesel from Cummins Service & Sales, Los Angeles.

THE *Emma H*, live bait boat, Newport Beach, Calif. has a new propulsion diesel, Caterpillar 150-hp. marine engine, replacing a gasoline unit of same power.

SOLD through Hallett Cuban distributor, Cia General de Motores Diesel, of Havana, for propulsion of fishing boat, a two-cyl. 18-hp., Hallett water-cooled diesel engine.

PURCHASED by Clearview Sand & Gravel Co., Snohomish, Wash., for use on water pump, a 4-cyl. 133-hp. General Motors diesel; a 200-hp. GM diesel having been installed to power a hoist.

FOR Trygve Johannsen, San Diego, a 170-hp. Caterpillar diesel from Shepherd Marine, to power 65 ft. long dragger *Jimmy*, driving through a 3:1 Snow-Nabstedt reduction gear.

POWERED with single cylinder Hallett 8-hp. diesel engines, two 5-kw. electric sets, have been shipped to distributor Importadora Industrial Agricola, in Guayaquil, Ecuador for resale to be used in agricultural application.

A WITTE 8 kw. diesel electric set (1 cyl., 12-hp.) Witte diesel to drive generator to supply power and lights for Clarence Bell's restaurant and store

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1064 W. 11th St.
Youngstown, Ohio
Phone 20763

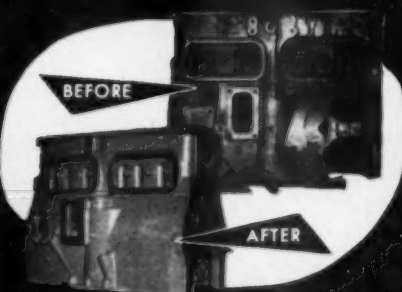
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And 110 ENGINES
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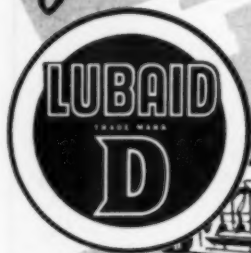
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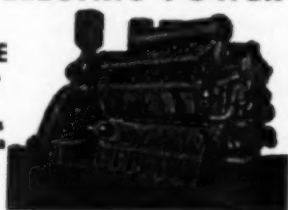
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FOR Star & Crescent Boat Works, San Diego, a 165-hp. Cummins diesel for power on a twin screw boat being rebuilt. A similar Cummins diesel, completely overhauled, powers second screw.

FROM Evans Engine & Equipment Co., Seattle to power John Beaufort's 40 ft. gaff headed sloop *Elmira*, a 2-51 General Motors direct drive, diesel marine propulsion unit.

Army Utility Boat



This 26 ft. Fiberglass utility boat, developed by the Army Transportation Research and Development Station at Fort Eustis, Virginia; built by the Cape Cod Shipbuilding Co. at Wareham, Mass.; was designed to carry personnel and perform light towing assignments in harbors and sheltered waters. Powered by a Model 387-CM, 66 hp. P&H diesel engine and equipped with a Snow and Petreley clutch, the speed of this boat during the trial runs over a nautical mile course was 14 knots, turning the engine at 1400 rpm. Engineers, at TRADS Fort Eustis, Virginia, conducted tests on this craft to determine its characteristics and usefulness. They compiled engineering and service data for possible use in the design and development of new Transportation Corps Harbor craft. Operational tests disclosed that the new craft was superior in maneuverability, carrying capacity and speed.

Illustrated Bulletin

A new 8-page illustrated bulletin describing Stay-new Ventilation and Air Conditioning Filters has been announced by the Dollinger Corporation, Rochester, N. Y., manufacturers of filters for every industrial need. The bulletin contains specifications, engineering and performance data covering dry type panel filters recommended for the removal of air-borne impurities. A copy of Bulletin #600 is available from the Dollinger Corporation, 11 Centre Park, Rochester 3, N. Y.

Manufacturer wants to represent and/or manufacture additional lines of equipment. Plate and sheet steel fabrication and ceramic coating facilities. Regularly contacts Navy and private shipyards on a national basis. Well known sales and engineering organization with large sales volume. File 11, DIESEL PROGRESS, Box 8458, Cole Station, Los Angeles 46, California.

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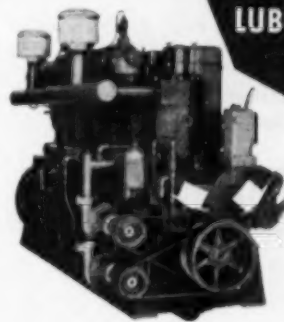
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